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A movement is brewing. And with its birth, the PowerVR architecture begins the awesome struggle against conventional 3D; and against the techno-bourgeoisie who attempt to enslave the gamer masses. These ~~manipulative~~ technologists are turning their machines of propaganda against GAMERS, desperately trying to make them believe that their [illegible] 3D performance is good enough.

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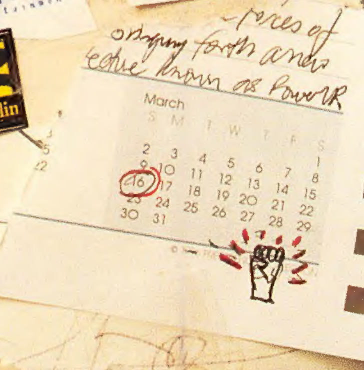

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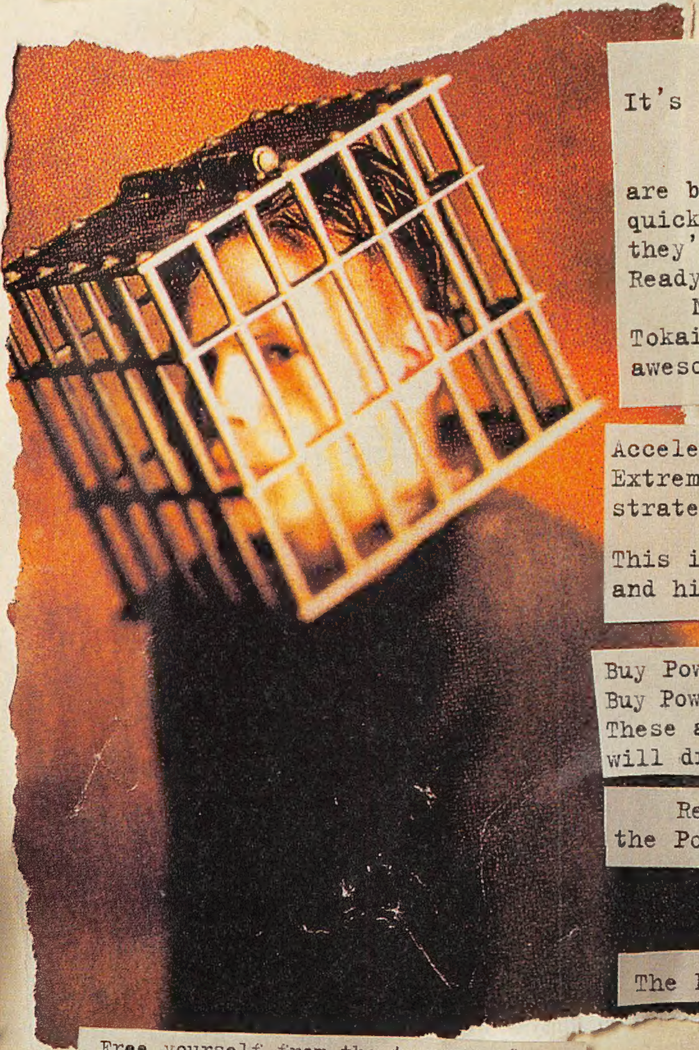

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46 Grind Your Own Java

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She struck a pose in *Playboy* in order to draw all eyes onto the first offering from her company, Black Dragon. But does the self-proclaimed marketing genius

Gillian Bonner

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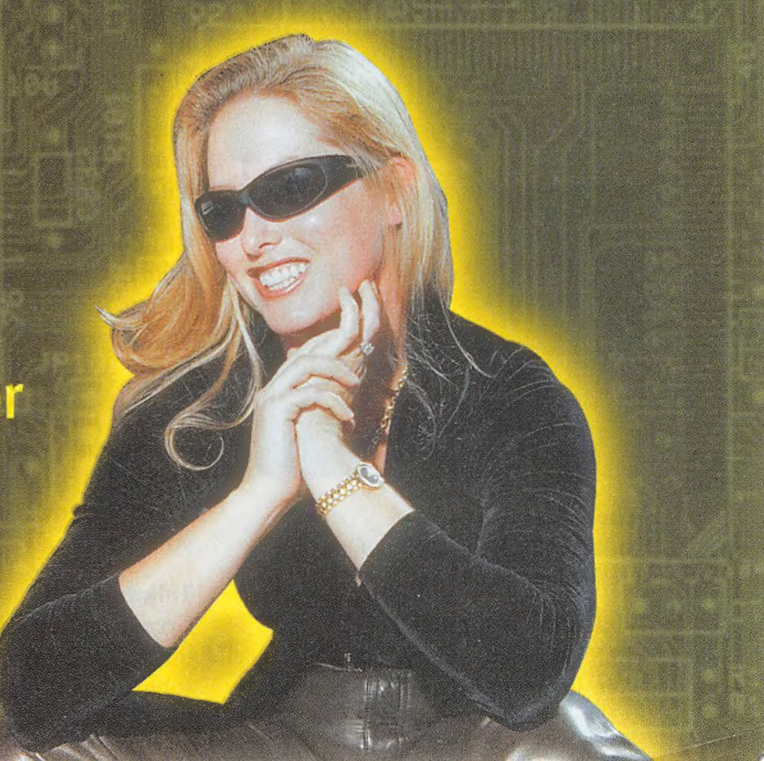

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(InfoWorld, Jan.'97)

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may 1997

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EDITOR'S WORDS

Klamath kometh

Sitting here in the catbird seat at the center of the PC world, I see a lot of amazing technologies and fascinating gadgets. I also get a glimpse of the state of the PC nation from the avalanche of letters I read from you, the *boot* reader.

Your voice comes through loud and clear and lately the message has gone something like this:

Help!!!

OK, I waited for MMX, now we're talking Klamath on a daughterboard?! I'm dying to ditch my year-old rig for the hottest, fastest one on the market. The problem is, each day brings an earthshaking development in design, speed, or upgradability. I know nothing is forever, but please say there will be a month or two without more "wait-worthy" developments.

Joel Dickinson

Joel's not alone. What started as a trickle is fast becoming a flood.

The two CPUs are as different as a Dodge Viper rolling thunder with mega-ponies under the hood and an Alfa Romeo Spider breaking ankles with hairpin turning.

First, everyone was waiting for the P-Pro. Then savvy insiders avoided the holiday rush and held off for the next-gen instruction set MMX. Now we had a dilemma on our hands: P-Pro or MMX?

Smart readers—confused by Intel's fork in the road—asked for directions.

Unfortunately, there was no pat answer. The two CPUs are as different as a Dodge Viper rolling thunder with mega-ponies under the hood and an Alfa Romeo Spider breaking ankles with hairpin turning. Which is better? It depends on what you use your machine for and what you value more. And, in the case of these CPUs, whether you were willing to wait.

Everyone wanted to know: Would there be an upgrade that brought together the best of both worlds?

The answer: Yes... and no.

As recently reported in *boot*, Intel has announced their next CPU, which combines the 32-bit kick of the P-Pro with the multimedia handling of MMX. And it's called Klamath... oh, sorry. Intel calls it "Pentium II" nowadays.

But you won't be able to upgrade to the next level. At least not any time in the near future.

Why? Because the-processor-formerly-known-as Klamath is a radical departure. Goodbye ZIF socket. Hello SEC daughtercard.

This new technology means more than a new CPU. It means you'll need a new motherboard. The specs on this new system look promising going forward and we're willing to bite the backward-compatibility bullet somewhat to make such a dramatic leap. But then what?

Will there be a lag for everyone who's waited for the ultimate, to catch up? We hope so, even if it's just a few months. I know from the letters such as the one above that everyone's getting a little skittish at this point. We want speed and we demand the best. It was one thing to commit to 133MHz knowing 166MHz was around the corner. After all, what's a few clock cycles between friends? But now we're talking leaps in architecture, instruction sets, and entirely new motherboard configurations.

We're talking high anxiety.

It's widely rumored that an MMX-enhanced P-Pro Overdrive is en route from Intel with a Q4 estimated arrival time, but who's willing to give up all the cutting-edge advantages of SEC?

Believe me, everyone at *boot* feels your pain... because we are in the same boat. Except we're picking up our new Pentium II motherboard tomorrow. We'll keep you informed. Promise!

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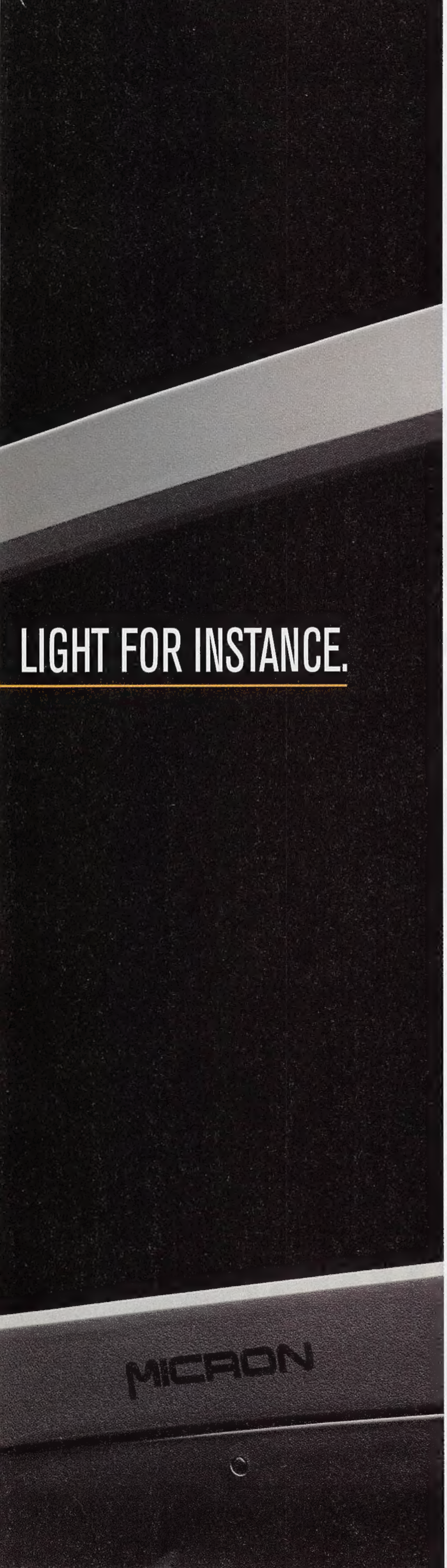

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commport

LETTERS TO THE EDITORS

Alex St. John fan club

After reading the two-part interview in *boot* 05 and 06, I wanted to slap Alex St. John. What arrogance!

Every time DirectX installs itself on my system I think of those garish pics you printed of him and I wish I had that big sword he was mugging with. DirectX is a pain in the ass. If I'm installing DirectX version 3.0a 3why does it say version 4.0000.38.00? Don't answer that question! As a gamer, I couldn't care less what those numbers mean!

After reading "DirectX under Attack" in *boot* 07, I spooged. I'm a huge fan of *Quake* and of id software, and I'm an avid gamer. Although I'm not a programmer or PC guru, I'm well-versed in the woes of DirectX and the damages it can cause to a system. I've had nothing but problems with Win95 games thanks to DirectX and I know there are thousands of other consumers who've experienced similar difficulties. I hope Microsoft and Alex St. John rethink DirectX—they should at least give gamers a new installation interface.

> "After reading the two-part interview in *boot* 05 and 06, I wanted to slap Alex St. John."

I avoid Win95 games like the plague, and I'll continue to do so until Alex St. John pulls his head out of his arrogant ass.

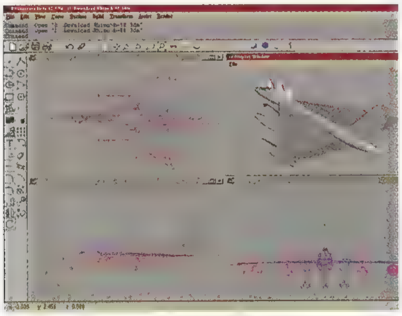
David M. Spell

Rhinoplasty

I love the *Rhino 3D* modeler program from *bootDisc* 06. Is there a web site offering new versions of *Rhinoceros*? I noticed that the program installs a tutorials directory, but there's no online help and no tutorial. Did I miss something?

Pete

Software Editor Sean Downey replies: *At the time of this writing,* Rhinoceros *is still a beta. You can download the latest version from* **www.rhino3d.com.** *The edges haven't been smoothed out of this beta version, so you won't find a tutorial, but a very instructional readme is included.*



Rhinoceros **is a NURBs-based 3D modeler made by Robert McNeel and Associates.**

Old software lizards

It's a real pain to hold on to old disks when you upgrade to new software. I reinstalled *Office 95* the other day after reformatting my hard drive and forgot that I had to have my old *MS Works* disks for proof of upgrade eligibility. Is there something I can do about this? I dread upgrading to *Office 97* since I'll probably have to cough up both my *Works* disks and my *Office 95* CD-ROM before installing *Office 97*. In the immortal words of Forrest Gump's mama: "Must be something can be done!"

Lizard

Dmitri who?

Monster 3D... Righteous 3D... Matrox Millennium... Dmitri Shostokavich! It's enough to make a person's head spin. When it comes down to pure speed, would I be better off pairing up a 3D-only card with a fast 2D card such as the Matrox, or waiting for the Stingray 128? Speaking of fast 2D, which do you prefer, the Matrox Millennium card or the Hercules/STB 128 cards based on the Tseng ET6000?

Ben

Technical Editor Chris Dunphy replies: *Get a grip on that head of yours! A lot of people are waiting for the Voodoo Rush-powered Stingray 128 from Hercules, thinking it will give the greatest combination of 3D experience and awesome 2D power. We've just received this board in-house, so look for a review in an upcoming issue.*

To clear up a misconception, the 3D performance potential of the Voodoo Rush and the original Voodoo chipset (in the Orchid Righteous 3D and Diamond Monster 3D) is identical. Based on my first impressions, the 2D half of the Stingray 128 seems solid, but it's not as world-class as the best stand-alone 2D cards. So the choice comes down to whether you want to fill two slots in your machine, picking and choosing your pieces, or fill one slot with the Hercules 128. The 3D speed will be the same.

As for the 2D-supremacy war between the Millennium and the Tseng ET6000. For gaming, I'd go with the unbeatable speed and compatibility of the Tseng chip, but for more serious Windows work I'd choose the Millennium because it excels in resolutions and color depths where the Tseng ET6000 fears to tread.

Rotten to the core

I recently purchased your magazine for the first time, and frankly, I am amazed at your repeated digs at Apple. Perhaps the next time you create a shortcut on your desktop (System 7 Alias), use the Start Menu (The Apple Menu), drag a file to the Recycle Bin (Trash Can), or run a QuickTime movie (Apple QuickTime for Windows) you might re-examine your disdain for Macs.

David Turner

Hardware Editor Andrew Sanchez replies: *We'll concede that Win95 "borrows" some items from the Apple OS. But the next time you grab your one-button mouse (Xerox Parc) and fire up your Graphical User Interface (Xerox Parc), click on an icon (Xerox Parc) and open your folder (Xerox Parc), you may want to remember where Steve Jobs "borrowed" these from. The geniuses at Xerox Parc had the mouse and GUI up and running years before anyone else.*

DOS: Alive and kicking

In response to Alex St. John's comment that DOS is dead, the situation that's killing DOS is not stupidity, but laziness on the programmer's part. With APIs such as DirectX, programmers are finding it increasingly easy to write for Win95, forcing us to upgrade our systems.

Win95 brought on a new era where every moron with enough cash can buy a Win95 system and do what everyone else does. We used to have fun getting that extra 2k of conventional memory and flaunting it. Using computers was a challenge, and I loved it. Of course, I still run DOS and am running Win95 merely to be compatible with today's generation of games. There are those, including myself, who have gone over to Unix and variations of it for a new challenge, which I think proves my point.

Win95 is bulky, slow, and a hog of resources, as have been nearly all applications from Microsoft since DOS 6.0 came out.

Anarch

Our webmaster avoids direct sunlight and crucifixes, but don't hold that against him.

boot's Gothic webmaster

I am a new subscriber and quite excited and impressed by the quality, originality, and wealth of information in your magazine. One question: What's a "Web Goth"? I Always read the masthead and noticed the above listing.

Dr. Charles R. Bender

▶ 10

Overclocked and overdrawn

I just wanted to thank you for the overclocking tip. I can now wait a while longer before emptying my bank account for a new Pentium processor. I have a 120MHz Pentium running at 133 and there's a very noticeable difference.

Paul

OS/2 goof

It was good to see OS/2 mentioned in a positive manner ion *boot* 07's bootWire. However, the accompanying screen shot implied the application was somehow related to OS/2. The graphic shows a Win95 screen, not an OS/2 screen.

It would have been more informative and helpful to OS/2 users and those considering using the operating system if you had chosen a native OS/2 app or a DOS or Win3.1 app which runs under OS/2, and accompanied it with an accurate statement.

Julian Reeves

News Editor Bryan Del Rizzo replies: *I mistakenly thought that particular Uninstaller image was from a set of images supplied to us by IBM. When I called IBM to check, I was told "uninstaller" was indeed part of OS/2. But of course, IBM was referring to a function of the operating system, and NOT the Win95 version of Uninstaller. Thanks to all who caught us napping.*

Raising the speed limit

Who cares if Intel clocked a Klamath to 400MHz, I want them to speed up the lousy bus bandwidth. A 400MHz CPU may look impressive but it's still running on a 66MHz bus. Enough clock doubling (and tripling, and quadrupling) and lets get some advancement outside the chip as well.

The Smiling Bandit

C64 rocks

Your C64/N64 comparison in *boot* 05 was on the nose. The Commodore 64 is a machine that can play games, be a word processor, a database manager, and the SID chip gives it an edge with built in sounds. The Nintendo is a game machine. Even though the two are in separate categories, I say the functionality of the C64 far outweighs the N64. The C64 still has programs that can be FTP'ed from around the world—anything from application programs to Unix operating systems. The only thing there is for the N64 are games, and you have to pay $30 and up for them.

I'd rather stick an arcade game in my den than spend tons of cash on a game machine with the same old titles as previous machines. My Commodore is running a fully fledged BBS, and the N64 sits on the floor waiting for the next hankering of a $60 game.

Matthew Price

Portable computing be damned

Enough with the notebook and the PDA reviews. I counted six notebook reviews between *boot* 07 and *boot* 08, and a feature dedicated to PDAs! This is a magazine for power users, with an emphasis toward gaming and graphics. Leave the notebooks and PDAs for those crappy "notebook-only" magazines that nobody buys.

Michael Anderson

Editor-in-Chief Brad Dosland replies: *It used to be that notebooks were the red-eyed stepchild of the computer world—complete with last year's CPU speed and a crippled feature set. The notebooks reviewed in* boot *stand toe-to-toe with most any desktop brawler in their features and sheer speed. Once 3D acceleration finds its way into that little box, their bulky brothers had better watch out! You'd be hard-pressed to come up with a better way to kill time between LAX and JFK than a deathmatch at 36,000 feet.*

As for PDAs... try one of the new breed and you'll be a convert.

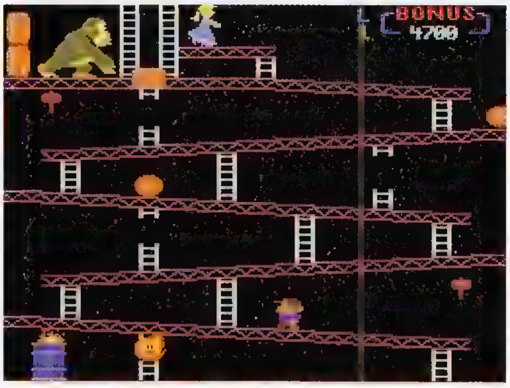
Official OSR/2 bootlegs

The USB preview in *boot* 07 mentioned that Win95 OSR/2 isn't available to end users looking to upgrade. It is. I'm not talking about purchasing a new hard drive, I am talking about the OS itself. Just go to the nearest small computer repair shop and request it, most will sell it to you, no hassles. Better yet, go to a larger computer retail chain store and ask one of their staff to electronically put up their inventory list for you, it's likely that Win95 OSR/2 will appear on the screen at around $100.

Evan Kultangwatana

News Editor Bryan Del Rizzo replies: *OSR/2 is only available to consumers who have purchased a new PC. The new features of OSR/2 (including USB and FAT32 support) will be integrated into the next retail release of Win95 (codenamed Memphis), slated for release this fall. If a store is selling the OSR/2 upgrade separately, they're doing so illegally and are breaking their OEM license with Microsoft.*

MMX: an Intel scam?



The MMX-enhanced version of *Donkey Kong* features 16-bit barrels and a Gouraud-shaded Mario!

Great, just what we need: A technology to help consumers who don't want to pay the extra cash to upgrade their equipment. Next year, we'll still be buying games that are usable on P100s and Sound Blaster 16s. MMX enhancements will only be noticeable on systems with low-end hardware. Do you really think I'm gonna notice MMX technology on my Pentium Pro 200MHz with its Matrox Mystique 4MB video card? It might make the benchmark tests look a little better, but I'm not going to notice. If you can't afford to upgrade your equipment, then you deserve to still be playing Donkey Kong. As for me, I'm completely against any new technology that hinders my future. I was hoping that next year I'd be buying Pentium Pro-only games. MMX is just another money making scam for Intel.

Marco Belmonte

> "If you can't afford to upgrade your equipment, then you deserve to still be playing Donkey Kong. MMX is just another money making scam for Intel."

Editor-in-Chief Brad Dosland replies: *Will you notice MMX on the killer system you describe? Yes. You'll notice it in areas that go largely unaddressed by the Pentium Pro, and in areas that are not easily alleviated by even 200MHz speeds, and in the shortcomings the Mystique fails to cure.*

So, is MMX a scam? Not as a technology, but the way Intel released it (hushing it up througout the holiday shopping season so they could clear existing stock, launching so soon after the P-Pro, and forcing power users to choose between the two) smacks of scam. Still, MMX is for real and more and more software will take advantage of it going forward.

We have better things to do with our fingers than to put them on this.

You should see the MMX-enhanced version of Donkey Kong*...*

Another use for your middle finger

I disagree with Andrew Sanchez's review of the Microsoft Intellimouse. It's true that there aren't many apps that support it yet, but this kind of thing comes down to personal taste.

The negative review seems biased by the fact that most apps are not ready for this mouse yet. Isn't this the necessary evil of developing new hardware? When a hardware product first comes out, you don't get to fully utilize it until the software catches up. If new hardware is going to be reviewed this way, everything will get a substandard rating before it gets a chance to prove itself. Do we trash MMX technology because most apps are not written for it yet?

Bruce Bonacci

> "Once again a testosterone-laden reviewer has used 1/3 of his brain and played a game that doesn't involve shooting at a moving target in 3D and decided it doesn't merit his approval."

Hardware Editor Andrew Sanchez replies: *My dissatisfaction with the Intellimouse stems from many things, not just its lack of support. I didn't like the awkward design of the mouse (while many call it ergonomic, it induced pain in my lower palm after extended use), the problematic installation (it worked on about 50 percent of the computers we tested it on), and the quirky software (even when it did install, the wheel wouldn't work when it was supposed to). Toss in a lack of DOS support (so much for re-programming that wheel in* Quake*), and you come up with an ordinary Microsoft Ergonomic Mouse with a wheel slapped on it. I expect more for $84.99.*

Even with all of the hype, Bethesda's *SkyNet* still wasn't very good.

Bethesda: read this!

It is unbelievable that *SkyNet* was created more than five months ago and there's still no fix for the video problems we're having. This game is supposed to be a SuperVGA, 640x480 game and anyone having a Matrox Mystique Video Card is pretty much S.O.L. The tech support at Bethesda is no help at all, and I haven't received any answers from Matrox either. Can you could look into it?

Scott the Frustrated

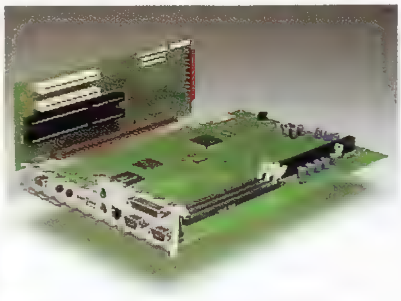
Technical Editor Chris Dunphy replies: *Despite their excellent performance, Matrox cards have always had a reputation for being just a bit different from the more mainstream graphics cards, and they tend to suffer from more annoying incompatibilities and glitches than most. Your best bet is to keep hounding tech support for both Matrox and Bethesda. Hopefully, with enough pressure, they'll manage to release a patch. If that fails, return the game and get your money back.*

Fury over Microsoft games

I enjoy reading your magazine more than any other. Up to this point I've enjoyed every article....that is, until I read the interview with Microsoft's Alex St. John. Hmmm... let's see... *Hellbender, Microsoft Soccer, Monster Truck Madness, Fury*^{3}*, Microsoft Basketball*... need I say more? Here is an individual who has unlimited resources and is producing games at a level which are at best mediocre. Imagine the games Microsoft could be producing if John Romero, Sid Meier, Peter Molyneux, or George Broussard had access to the amount of capital and technology Alex St. John does.

Dan Sharrard

News Editor Bryan Del Rizzo replies: *You're absolutely right. And guess what? Microsoft has responded to these criticisms by partnering with some of the biggest names in computer-game history including WizBang Software Productions (*HyperBlade*), SingleTrac (*Twisted Metal*), Ensemble Studios (*Civilization*), and Digital Anvil (headed by "*Mr. Wing Commander*" himself, Chris Roberts). In the meantime, check out the* bootNet *site for a preview of upcoming Microsoft games, including* Baseball 3D *and* Age of Empires.



Intel's new NLX formfactor motherboard will incorporate a Single Edge Contact cartridge.

Gosh, thanks!

Tom Halfhill's insights into Intel's plans for daughterboards w/CPUs in *boot* 07 are well-structured and informative. In comparison to other PC magazines, *boot*'s articles have substance, and not just gibberish for some teenager's wet dream of cranking out ultra-high refresh rates in *Quake* (which is not to say that *boot* doesn't do a top-notch job of reviewing video cards). Keep up the good work. *boot* is a "Kick-Ass" PC mag.

Allan Bronshtein

Excessive gore

In your interview with the Reality Bytes about their game, *Dark Vengeance* (preview in *boot* 07), you mention similarities between their game and *Tomb Raider*. They indicate that *Dark Vengeance* is superior because of the more horrific quality of their enemies and the very graphic and realistic gore.

I think most people who are really into *Tomb Raider* (myself included) have turned away from games such as *Doom* and *Quake* because the gory reality of those games is not enjoyable. The joy of *Tomb Raider* is that it's so intricate, the levels are really beautiful to explore, and it's not a "slash your way to bloody glory" game. As for being monotonous, every time I've played *Tomb Raider* all the way through, it has been different and surprising. Also, about the claim by the makers of *Dark Vengeance* that players will become "totally immersed" in the game... I don't *want* to become fully immersed in a computer game. I want to be fully immersed in life and just obsessively play my computer games!

News Editor Bryan Del Rizzo responds to criticisms from a passionate *boot* reader.

Beth Warner

Phantasmagoria 2

Once again a testosterone-laden reviewer has used one-third of his brain and played a game that doesn't involve shooting at a moving target in 3D and decided it doesn't merit his approval. Let's join the human race and realize that there are plenty of us who enjoy PC games that involve thinking and not just random firing from a joystick! *Phantasmagoria2: A Puzzle of Flesh* creates a haunting story that's involving and although it is linear, it is like any logical conclusion and maps in a specific direction when followed. Surely there is enough gore for even the most hardcore horror fan and enough stimulation for those of us who like to ponder outcomes. It is incredible that you devote an entire page to *Redneck*

▶ 12

Rampage and discuss how "hilariously violent" it is, and yet all that you seem to understand about *Phantasmagoria 2* is that a lot of tape was shot and it's well-acted. Please try and live up to the level of the technical hardware reviews you specialize in when writing about games, or perhaps you should stick to subjects you can handle.

Kirk Sparrow

Today's blue-light special: DVD

In *boot* 06 you say DVD is available as of December '96. I just heard from a friend that DVD has been delayed, so what's the scoop?

Anthony L. Bugg

News Editor Bryan Del Rizzo replies: *DVD was delayed in part due to copyright issues. Now that those issues have been resolved, DVD movie players and DVD-ROMs should be available by the time you're reading this issue of* boot.

The availability of software, however, is another story, and will depend on the release schedules of the software publishers. And, although many software companies have jumped on the DVD bandwagon, it's possible the first DVD-ROM games will just be rehashed releases with extra video footage thrown in to fill up the disc. Additional storage capacity doesn't necessarily mean a better game.

"Win95 games are mostly trash because they're slow and usually consist of someone throwing together junk with a Microsoft SDK."

More Microsoft bashing

Hats off to *boot* and John Carmack. Finally, someone from this industry has enough cojones to step up and say what every user has know for well over two years: DirectX sucks!

Mr. Gates and his merry band of hyperactive children should take heed. After all, it's one thing to piss off users, but it's quite another to piss off *Quakers*! We won't get even, we'll just frag your sorry butt!

The industry that Bill Gates claims to have such a loving relationship with is now stepping forward and saying enough is enough. No more half-baked, overhyped Microsoft dribble. We want solid, refined, quality products, something Microsoft users have been demanding during the last few years.

Matt Livingstone

Not everyone agreed with what Microsoft's Alex St. John had to say.

Win95 sucks!

Windows is about the worst OS ever. It incessantly wastes resources and has a horrible interface. I run OS/2 and am constantly plagued by Windows trash. I have to run NT for a few Win32 programs that I can't replace at the moment and I only use NT because it's the most stable Windows there is, even though it's inferior to superior OS's such as OS/2, Unix, and even DOS.

Win95 games are mostly trash because they're slow and usually consist of someone throwing together junk with a Microsoft SDK. What's worse is the good stuff such as *Prey* and *Unreal* are going to go there, too. Alex St. John says programming for DOS is foolish because it's harder and slower, and it brings configuration problems to the user, when in fact it's exactly the opposite way.

Matthew Rezny

Dogfight

I liked your review of *Jetfighter III* so much, I bought the game. You were right on the money again, it's a great simulator. It was a bear to get the game to accept my sound card and graphics cards, but once I figured it out, it was worth the effort. By the way, your magazine is what a real computer magazine should be: informative. Thanks.

Charles R. Scroggs

P.O.'d at the post office

About the U.S. Post Office's attempt to charge consumers for e-mail... I wonder what bureaucratic nitwit came up with this idea.

You say that the plan is only for bulk or priority mail. But, how long will that last? The post office doesn't own the Internet, and has absolutely nothing to do with the transmission of e-mail. Plus, you already pay for e-mail when you pay your ISP. The ISP maintains the servers, and if they want to charge for bulk mail, or priority transmission, that's their business. The post office does not and should not have anything to do with e-mail.

Scott Holland

Suitable for every age group

Once upon a time, a few generations ago in the computer era, I knew nearly everything worth knowing about computers, and now in a short few months I have been left behind.

I bought my first computer when the Apple 2+ was introduced to the market. I took a course at the University of Toronto to learn the first 100 commands of DOS 2.0 and some simple Basic programming. We were required to supply our own computer, so I constructed a case large enough to hold the computer and the nine-inch TV I used as a monitor. By the time I finally had a proper monitor, a 5.5 external drive, and a printer, I had spent a small fortune,

I interfaced the computer with my Ham Radio station so I could send and receive RTIY, Morse code, and slow-scan TV. Soon I went from my 286 to a 486 with a CD-ROM drive. Just as I was feeling comfortable with DOS and Win 3.1, Win95 came along. I refused to join the race, and now I'm left behind.

In a few months I will retire and join the senior citizens club. Then I'll get myself a new computer with all the bells and whistles, and yes, I will get online. I still don't know why I need any of this stuff. Maybe because I learning is enjoyable.

Elio Pighin

Alpha bits

I just received *boot* 08 and Chris Dunphy's response to the Clinic question about running NT on an Alpha, is incorrect. FX!32 is a neat little program from Digital that allows most X86-based programs to run on the Alpha chip. Even DirectX games such as *Diablo* and *Deadly Tide* work with this. Microsoft offers an NT-specific version of *Office* for NT. It's a couple versions old now that *Office 97* is here, but it runs on Mips R4x00, DEC Alpha, and PowerPC. Does this mean everyone should run out and buy an Alpha? Heck, no. Unless you have a need to run one of the 1,800-or-so programs written for NT/Alpha there's really no point.

Brad Nichols

Siskel and Rodney

Two big thumbs up for Editor's Words, "Can't we all just get along?" in *boot* 08. It's about time someone commented about this problem. Where I work, all the gurus in data operations are exactly like you describe. I consider myself pretty well-versed in PCs and a lot of people look to me for help in fixing the problems that D.O. considers insignificant. Keep up the great work, you have a life-time subscriber here.

Mike Duane Jr.

Cut, Copy, Paste

In *boot* 07 and 08, we make reference to the 20-pin Molex power connector found on some motherboards (pg. 61 in *boot* 08). The 20-pin Molex is a 3.3v power connector, conforming to the ATX standard. We apologize for any confusion or misrepresentation.

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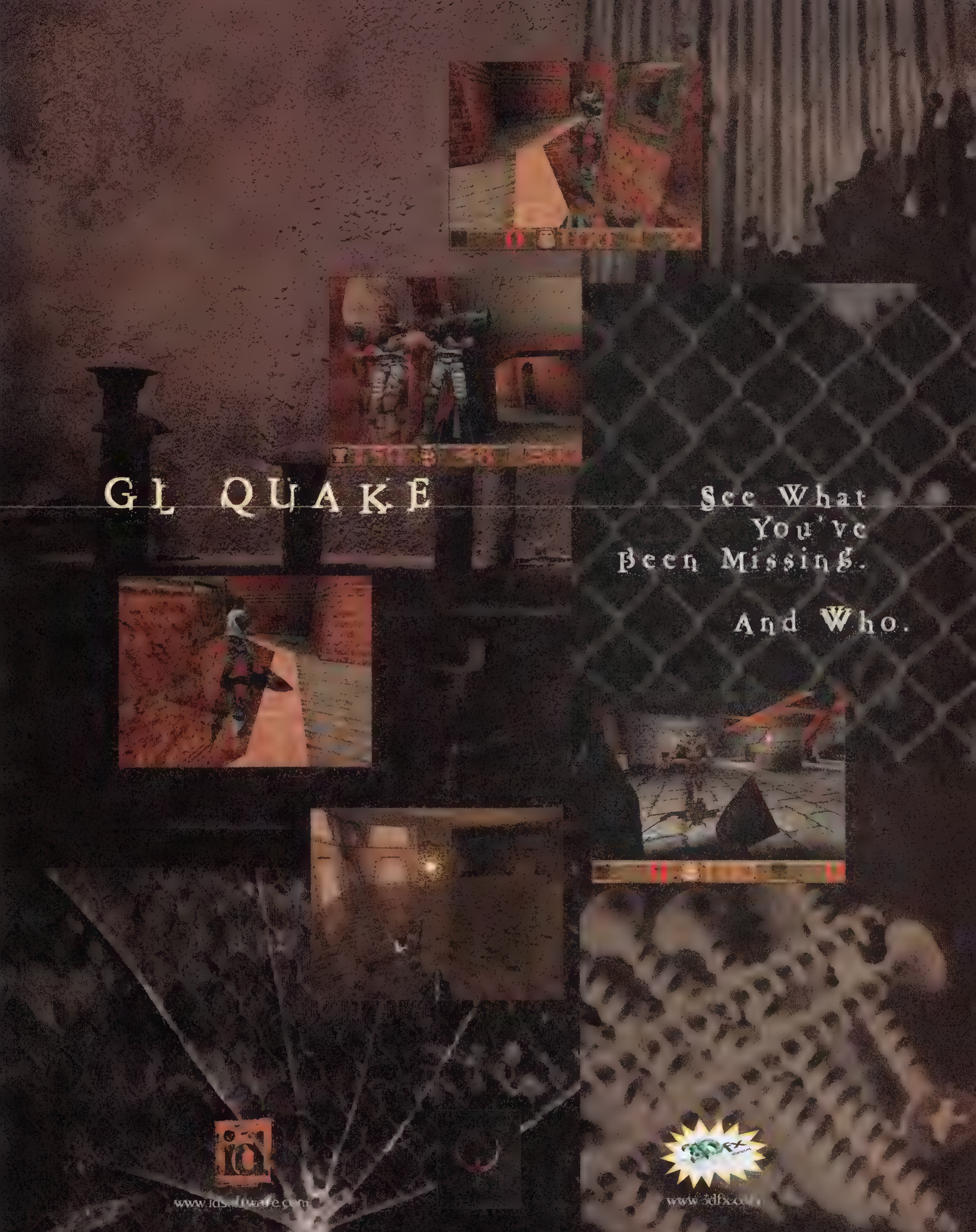
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Screenshots of GL version of Quake™ run on Voodoo Graphics. Screenshots from Quake™ © 1996 id Software, Inc. All rights reserved.
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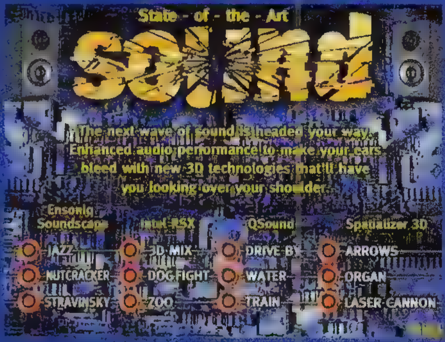
Product Information Number 373

boot DISC NINE

Every month, ***boot*** magazine delivers 600+MB of the hottest software and exclusive demos. If it piques your interest in the magazine, look for the ***bootDisc*** logo and you'll find the fattest demos and coolest apps to complement our cutting-edge previews, reviews, and features.


State - of - the - Art
sound

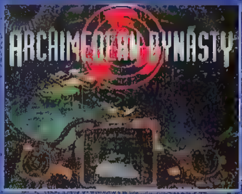
The next wave of sound is headed your way. Enhanced audio performance to make your ears bleed with new 3D technologies that'll have you looking over your shoulder.

Ensoniq Soundscape
JAZZ
NUTCRACKER
STRAVINSKY
Intel RSX
3D MIX
DOG FIGHT
ZOO
QSound
DRIVE BY
WATER
TRAIN
Spatializer 3D
ARROWS
ORGAN
LASER CANNON

Feature: State-of-the-Art Sound

Check out some of the new 3D sound technologies talked about in this month's state-of-the-art sound article. We've included samples of these technologies on the *bootDisc* using Ensoniq Soundscape, Intel RSX, QSound, and Spatializer 3D. You don't have to install any software. Just seat yourself between your speakers and click on one of the buttons to experience 3D aural bliss.

Demos:


ARCHIMEDEAN DYNASTY

DOS. Demo has a built-in time limit of 14 minutes. By Blue Byte. **See the review on page 106.**

DOCUMAGIX
HotPagePlus DE

Win95. This is the Discovery Edition and one-third of the full *HotSuite*. **See the review on page 92.**

Win95. Demo is limited to one level with various features turned off. **See the review on page 106.**

Win95. Evaluation version of full application expires in 30 days. By MetaTools. **See the review on page 90.**

EMPEROR of the FADING SUNS

Win95. Demo is fully functional with a limited number of turns. **See the review on page 96.**

Marble DROP
The Mesmerizing Mindbending Marble Game

Win95. This is a fully functional demo of the first five levels. **See the review on page 92.**

DEBABELIZER

Win95. Demo is fully functional with the Equilibrium logo embedded in all saved images. **See the review on page 93.**

FOOTBALL PRO '97

Win95. Demo doesn't include Play Editor, League Play, Game Length, and Multi-player Play. **See the review on page 89.**

Win95 and DOS. Demo is fully playable and includes the first three levels. **See the review on page 91.**

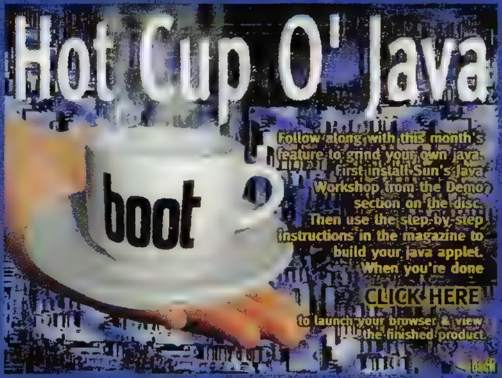
DOCUMAGIX
HotCargo Express

Win95. This is the Discovery Edition and one-third of the full *HotSuite*. **See the review on page 92.**

Win95. Demo is fully functional with one mission and eight-player network support. MMX enhanced. **See the review on page 77.**

pod
UbiSoft

Win95. Demo offers two of the 16 tracks and two of the eight cars. MMX enhanced. **See the review on page 76.**



Hot Cup O' Java

Follow along with this month's feature to grind your own java. First install Sun's Java Workshop from the Demo section on the disc. Then use the step-by-step instructions in the magazine to build your java applet. When you're done

CLICK HERE

to launch your browser & view the finished product.

Feature: Grind your own Java Applet

Everything you need to build your own applet can be found right here on the *bootDisc*. We've included a full 30-day working version of Sun's *Java WorkShop*, located in the Demo section, as well as all of the graphics and sound files required to follow along with the magazine article—they can be found off the root of the *bootDisc* in the \GroovyBox directory. We've even included the source text so you don't have to type it in! So, what are you waiting for? Go brew your own Cup O' Java!

3Dfx. Win95. Same as the regular version but requires a 3Dfx video card. MMX enhanced. **See the review on page 76.**

Realms of the Haunting

DOS. Demo is a fully playable version with limited levels. **See the review on page 106.**

REBEL MOON RISING

Win95. Demo is a fully playable version with limited levels. Requires an MMX CPU. **See the review on page 77.**

SEGA RALLY CHAMPIONSHIP

Win95. This is a fully functional demo of the first track. MMX enhanced. **See the review on page 76.**

Sidekick 97
Starfish Software

Win95 or NT. Evaluation version of full application expires in 30 days. **See the review on page 100.**

WARNING

THIS SITE CONTAINS GRAPHIC MATERIAL THAT MAY TURN YOUR LOVE OF PCs INTO AN OBSESSION

www.bootnet.com

bootNet sports many of the exciting features that make *boot* magazine such a valuable resource for the hardcore PC enthusiast. There are reviews and previews, bootWorthy products, and an expanding archive of articles from past issues of *boot* online for easy reference, complete with a search engine.

bootDisc

Here's what's on the current *bootDisc*, complete with live links to the software companies' web sites. Download some of the smaller demos for a taste of what you'll get each month on the *boot* CD-ROM.

bootLive

The bootLive camera setup is a way for you to feel connected to your favorite bootBoyz and bootGrrlz. Can you spot them walking by? And hey, if you see someone slackin', flame them via e-mail!

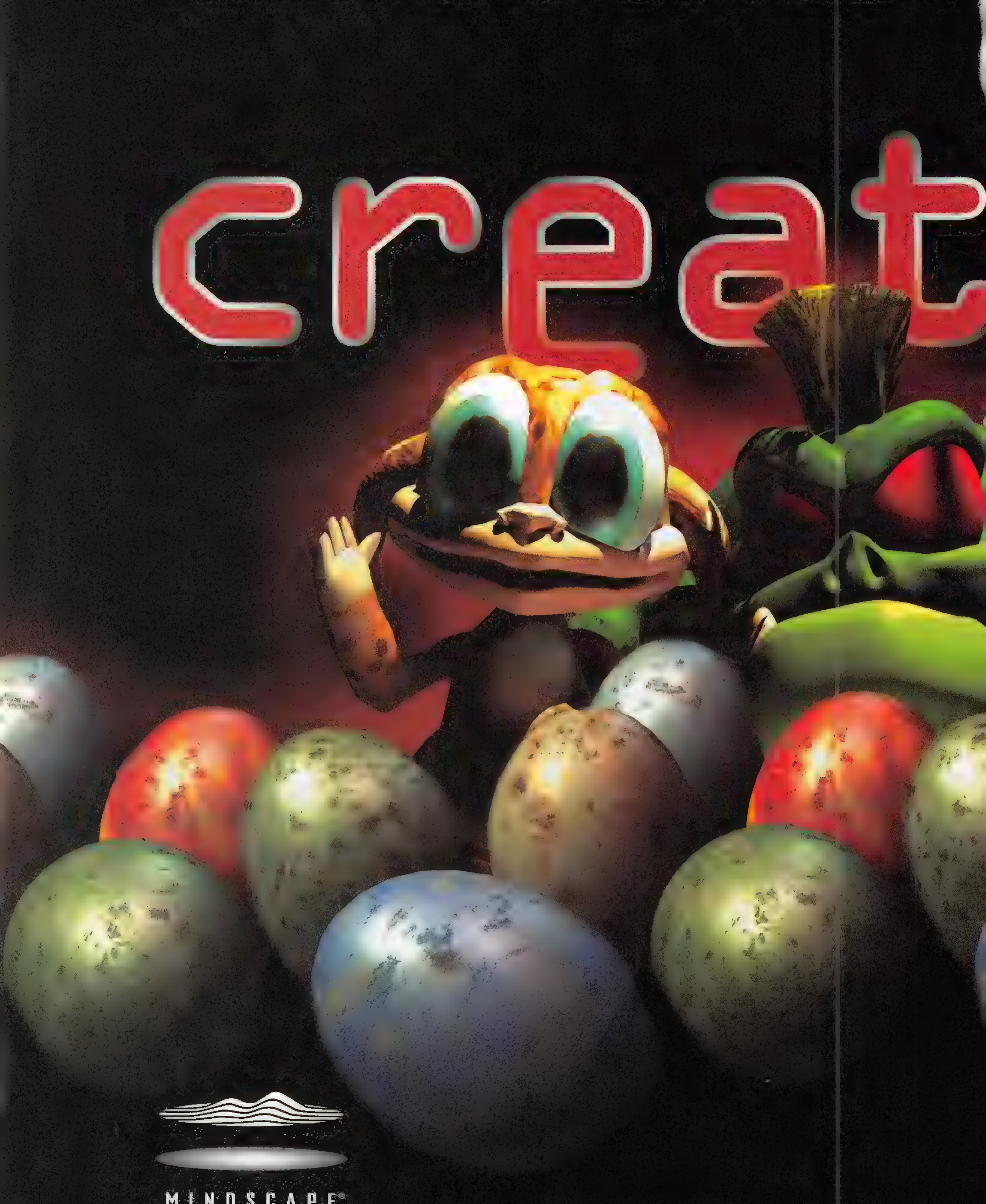
Previews

This section of the *bootNet* site contains the latest previews of coming hardware and software, plus previews of products that didn't make it in time to be included in the magazine .

Email List

You want to know about what's hot and you want to know now, right? So, join *boot*'s e-mail list and as soon as a story's posted on *bootWire*, you'll be on top of it!

The *bootDisc* is compatible with both Windows 95 and 3.x. Run start95.exe to launch under Win95, and start31.exe under Win3.1. *boot* recommends a Pentium 90 or better with 16MB for access to all the software that's included. Slam the *bootDisc* into your CD-ROM drive to give yourself an injection of Pure PC Power.


Create and Breed Your Own Artificial Life
creat
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"Call it a game if you like, but this is the most impressive example of artificial life I have seen."

Richard Dawkins, Oxford University zoologist and author

ures™

"I first saw this program in the same week that evidence was discovered of life on Mars. This is more exciting."

Douglas Adams, Author of Hitchhiker's Guide to the Galaxy

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NUGGETS

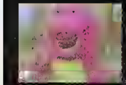
Top-Selling PC Games of 1996 (courtesy of PC Data)

1. Myst
2. WarCraft II
3. Microsoft Flight Simulator
4. Duke Nukem 3D
5. Civilization 2
6. Barbie Fashion Designer *

7. Command & Conquer Red Alert
8. Microsoft Return of Arcade
9. Command & Conquer
10. Madden NFL '97
11. Monopoly Multimedia
12. MechWarrior 2
13. Ultimate Doom Thy Flesh
14. Doom II
15. Star Wars Rebel Assault II
16. MechWarrior 2: Mercenaries
17. You Don't Know Jack
18. 3-D Ultra Pinball
19. Quake
20. NHL Hockey '97

* Is it us, or aren't you disturbed that games such as *Command & Conquer*, *Quake*, and *MechWarrior 2* are outsold by *Barbie Fashion Designer* and *Myst*?

He's Back!



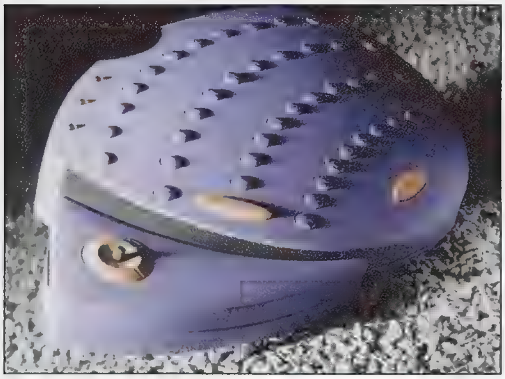
Although those pesky, perky Bananas In Pajamas are the current pre-school flavor of the month, Barney may soon be making a comeback, thanks in part to Microsoft's new line of interactive toy dolls called ActiMates.

The ActiMates are a pre-school early learning system focusing on learning readiness and early learning skills to make learning both fun and fascinating. The Interactive Barney doll ships with a PC Pack transmitter (which plugs into the game port) and the *Fun on Imagination* CD-ROM game. Interactive Barney and PC Pack are available for $109.95 and $64.95 respectively.

All the ActiMates dolls are equipped with a 14,000 word vocabulary chip allowing them to interact with children running ActiMates CD-ROM software or specially encoded ActiMates movies on videotape. Additionally, sensors in the eyes, feet, and hands allow Barney to respond to a child's touch. Cover his eyes to play a game of peekaboo, or squeeze his foot to hear a refrain from one of 17 songs such as "Alphabet Song" or "I Love You, You Love Me."

SEX SELLS!

According to a report in the *San Jose Mercury News*, the hottest selling computer game in Japan last year was a "love simulation" game in which boys (otherwise known as Otaku) try to get a virtual girl, Shiori, to fall in love with them. There's even a magazine, *Virtual Idol*, devoted to supplying fictional biographical tales of Shiori and other virtual girls. Said one avid player and magazine reader, "*Virtual Idol* is just the right kind of magazine for a person like me who's not interested in real girls."



What a Great Idea

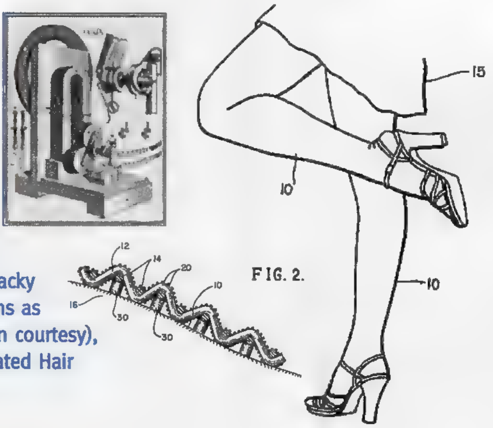
Cambridge Consultants Limited's new Information Display Engine (IDE) structures information in a horizontal hierarchy allowing you to browse by simply scrolling up and down using a special input device, called (appropriately enough) "the idea."

The control device incorporates a keyboard and a double-sided handset. The keyboard allows input of text information, while the handset incorporates a thumb-operated joystick allowing interaction with the on-screen interface.

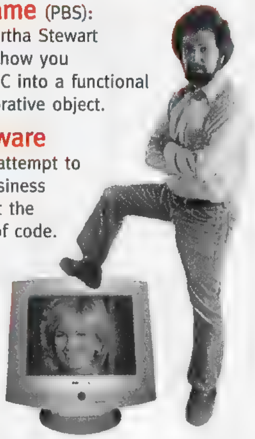
If You Build It, They Will Come

The IBM Patent Server (**patent.womplex.ibm.com/**) lets you access more than 26 years of patent descriptions as well as the last 17 years of images. You can search, retrieve, and study more than two million patents dating back to January 5, 1971. Searches can be conducted by patent number, simple text phrases, or more advanced information such as inventor, assignee, or patent agent.

For a taste of the strange and wonderful, access the Gallery of Obscure Patents. Check out such wonderful inventions as the human slingshot machine (patent # 5421783, issued June 1995), non-staling aerated bubble gum (patent # 5045326, issued September 1991), or the device for making artificial egg yolks in the form of discs (patent # 5547358, issued August 1996). There's even a Wacky Patent-of-the-Month award given to such illustrious creations as the Saluting Device (so you'll never forget to tip your hat in courtesy), or our favorite, the Nylon Hose Treated with Microencapsulated Hair Dissolving Solution (to keep your legs silky smooth).



Television Shows We'd Actually Watch



This Old Mainframe (PBS): Hosts Bob Vila and Martha Stewart revamp a Univac and show you how to turn your old PC into a functional doorstep or other decorative object.

Name That Software (MSNBC): Contestants attempt to identify well-known business programs by looking at the least number of lines of code.

My Three Suns (C/Net): Neighbors wonder why Steve Douglas keeps three Unix based workstations in a suburban neighborhood.

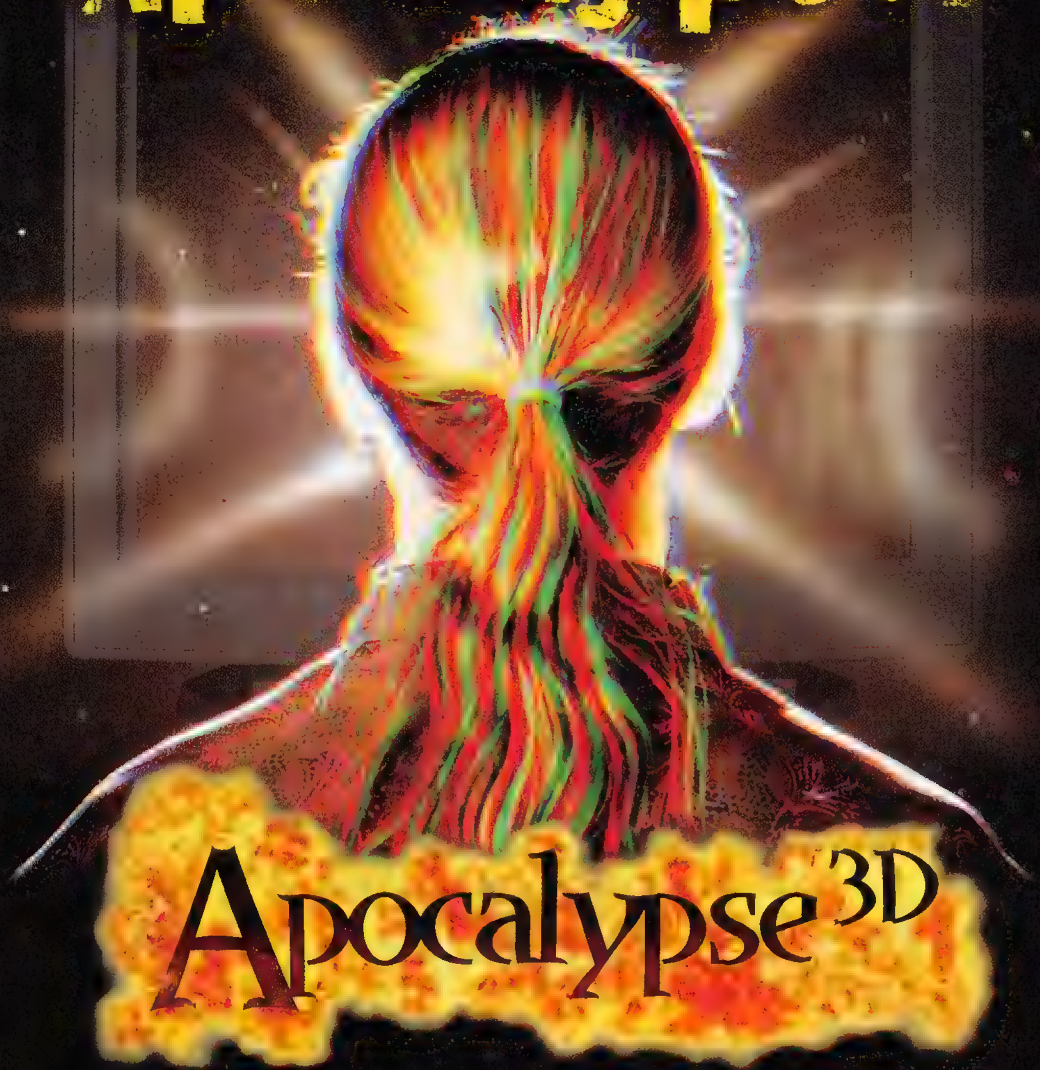
Wang Can Cook (Food Channel): Chef Charles Wang blends together software in an incomprehensible manner from companies he has purchased. Studio guests grudgingly pay ever-higher prices for Wang's creations.

Leave it to Spindler (CBS): The Spindler tries to earn money by selling apples but finds he can't sell them for as much as he paid for them; so he tries to make it up in volume. Ward, June, and the Board of Directors co-star.

WordPerfect Strangers (ABC): Larry decides that using groupware would be a good way to meet women, but Balki's laser printer explodes ruining any chances of connectivity.

Are you ready for the

Apocalypse?



Apocalypse 3D

Explosive Acceleration for 3D Games

"This card most certainly rocks."
–*Boot, April '97*

"...Apocalypse 3D is the most powerful, affordable and downright desirable 3D games technology..."
–*CGW, Jan '97 (UK)*

"The VideoLogic Apocalypse 3D will revolutionize your games playing."
–*PC Answers, Jan '97*

"Apocalypse 3D from VideoLogic really sets the standard."
–*PC Advisor, Feb '97*

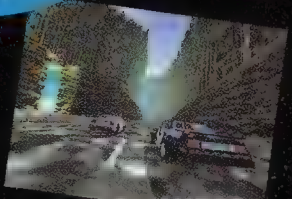
"An awesome card."
–*PC Home, Jan '97*

"Apocalypse 3D delivers incredible 3D performance."
–*Boot, Mar '97*

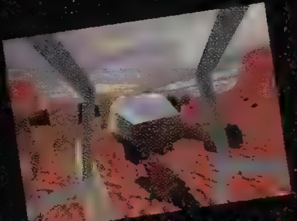
"★ ★ ★ ★ ★"
–*Computer Life, Mar '97 (UK)*

$199 MSRP

Apocalypse 3D
MECHWARRIOR 2



Ultim@te Race™ by [illegible]



MechWarrior®2 by Activision

Get MechWarrior® 2 and Ultim@te Race™
FREE WITH YOUR PURCHASE!

So you have an awesome gaming PC; but you're still looking at pathetic 2D or 'free' D? Supercharge your games with Apocalypse 3D. The hottest PCI 3D graphics accelerator, period.

This is the dawn of high-res and high frame rates with full z-buffered 32-bit on chip hidden surface removal, real time shadows, light volume rendering, transparency and fogging effects.

Awesome 4 MB of dedicated 3D Texture Memory totally rocks all Direct 3D and PowerVR games!

VideoLogic
(800) 578-5644

Tiger Direct
(800) 292-7218

WWW.VIDEOLOGIC.COM

VideoLogic

POWERVR

Product Information Number 340

by Bryan Del Rizzo bdelrizzo@bootnet.com

Designed for the Intel Pentium® processor with MMX™

MMX Malnutrition

Buyer Beware: Many Companies hop on the MMX bandwagon with inflated claims of benefits

As you scour the shelves searching for MMX-enhanced software and hardware to feed your new CPU, don't be fooled. Many products claim to go well with MMX, but some go down more smoothly than others.

When buying food with a label touting "low-fat" or "no-fat," you know exactly what to expect: fewer calories and not much taste. But when you buy a product labelled "MMX-Compatible," you may not get what you expect. MMX is an Intel trademark, and Intel protects it with all the muscle of the law.

From a hardware perspective, it's simple: the product must contain Intel-branded chips, such as the Pentium processor with MMX technology. Software, on the other hand, must take advantage of the additional MMX instruction sets, and developers must prove it to Intel's Developer Relations Group in order to qualify for the official MMX logo. Continued misuse of an Intel trademark, after all, can severely dilute or erode its value in the market. Unless you're a licensed OEM or software vendor of the "Intel Inside" program, the use of any Intel brand or logo is strictly prohibited.

MMX-Compatible

MMX-compatible

By strict definition, any product running on a PC has to be "MMX-compatible," since MMX is completely backward compatible. Even games and programs written for the old XT 8086 architecture will work on an MMX machine, regardless of whether or not it takes advantage of those extra instruction sets. A product claiming MMX compatibility is actually only claiming PC compatibility, and the MMX term is just being used to hook you in. The *bootDisc* could be classified as MMX compatible, as could the original *Doom*, or even DOS 6.22. All of them will work—it's that simple!

But, according to Chuck Mulloy, media relations manager for Intel, "Companies offering products which are compatible with Intel's MMX technology are fine, given that they are, in fact, compatible." However, Mulloy also states that the term "MMX-compatible" is "not OK with [Intel] for technical legal reasons." And should Intel ever catch you misusing the MMX logo or terminology, you'll at least receive a warning letter asking you to cease and desist.

When *boot* received a press release from a hard-drive manufacturer claiming their new drives were MMX-compatible, we called to find out what made these hard drives so special. Not surprisingly, shortly after our inquiries, the phrase was changed to the even more obscure "MMX-Ready."

Supports MMX

OPTIMIZED FOR
PENTIUM
SUPPORTS
MMX

Another example of flagrant MMX misrepresentation appears on the packaging for *Sega Rally Championship*. A close inspection of the logo on the box would lead you to believe this game brings the 60fps arcade experience home. And considering the game uses a 64k color palette and 640x480 SVGA resolution—a perfect situation for using MMX—it is disheartening to discover that *Sega Rally Championship* isn't specifically programmed to use MMX. But, according to Mike Wolf, producer of the game, "You will experience a 5- to 10-percent increase in frame rate." Of course, this increase in frame rate is attributable to the doubling of the L1 cache from 16K to 32K, and not through direct programming for the MMX chip.

Uses MMX Technology

Uses
MMX™
technology
70473

Although *G-Nome* doesn't run in a high-color environment, 7th Level did optimize some, but not all, routines for MMX.

"For this release [we] just optimized the slowest routines for MMX," says Bill Fahle, producer for 7th Level. "Of course, all the routines that can be done in hardware can also be done in software. Unfortunately, the performance can be so slow as to make it impractical for real-time use."

So, how do you distinguish a licensed MMX title from the phonies? Check the logo. If the packaging sports the official Intel MMX rainbow-gradient logo, you have the right ingredients to feed your MMX-hungry system. Anything less, and your system may suffer from malnutrition.

Microsoft Unveils New Internet Gaming Zone

Microsoft has announced major enhancements to its Internet Gaming Zone—including a new business model, several strategic alliances, and online-specific content—and looks poised to become a formidable opponent to TEN, Mplayer, and EarthLink.

In addition to the more than 10 classic games offered for free, such as backgammon, bridge, and chess, the Zone will also provide owners of other Internet-ready games by Microsoft—including *Monster Truck Madness* and *Microsoft Golf 3.0*—the ability to jump into Internet multiplayer mayhem at a mouse-click. Additionally, *ZoneLAN*, Microsoft's version of *Kali*, will simulate IPX LAN protocols over TCP/IP, enabling older, local network-specific games to play over the Internet, too.

The Zone will also provide access to DWANGO's network, offering a low-latency multiplayer option.

In addition to the free content, the Zone will feature a pay-per-play Premium Games category with tournaments and games designed for Internet play. The first game, *Fighter Ace*—a World War II air combat game developed by VR-1—is scheduled to debut on the Zone this summer. *Fighter Ace* will feature more than 12 planes, scenario and arena-based combat, team play, multiple skill levels, and texture-mapped polygon terrain modeling, *and* it will support more than 100 pilots in a single flight arena.

Although pricing has not been finalized, Microsoft spokesman Steve Murch said daily and monthly subscriptions will be available.

Online Game Wars Heat Up

Mplayer gaming service now offered for free; EarthLink cuts hourly rate and Ten raises theirs

Mpath Interactive, one of the leading online service providers, dropped a bomb in February when it announced it was abandoning the subscriber-based business model, and would instead offer its online multiplayer gaming service for free. But while gamers were ecstatic to learn of this new development, Mpath's unexpected announcement has left other online service providers—including TEN and EarthLink—in a state of shock, reeling in the face of possible customer defections.

> "Either Mpath has extremely deep pockets, or they'll end up putting themselves out of business." *—Brad Sobel, director of online games for EarthLink Network*

In addition to the Mplayer Free Zone, which offers unlimited free access to games such as *Quake*, *Red Alert*, and *Scrabble*, Mpath also announced the creation of Mplayer Plus, a premium area that will provide unique content along with tournaments, contests, and prizes. The cost? Only $29.95 *per year*; well below the current rates offered by TEN, DWANGO, and EarthLink. But in order to offer a free service, Mpath is counting on badly needed advertiser revenues to recoup overhead costs and turn a profit.

"The subscriber model is hampering the growth of the online games market," says Kristin Asleson, vice president and general manager of Mplayer. "And in order to grow the market, Mplayer is leading the industry in allowing gamers to play many of their favorite games for free. Plus, advertisers love the ability to communicate directly with a highly educated, high-income, and Internet-savvy membership."

> "Mplayer, in my opinion, is right on target; Internet-based services will have to follow this model." *—Bob Huntley, president of DWANGO*

Other game services agree: "Mplayer, in my opinion, is right on target," says Bob Huntley, president of DWANGO. "Internet-based services will have to follow this model, because the consumer is already paying a subscription to their ISP."

However, not everyone is convinced. "We don't expect Mpath to be an aggressive competitor," says Jack Heistand, president and CEO of TEN. "Mpath appears to have given up on Mplayer as a premier entertainment network for online gaming, and is clearly struggling to find a business model that works."

"Most content-driven web sites, such as Gamespot and Gamecenter whose main source of revenue comes from advertising on their sites, all operate in the red," says Brad Sobel, director of online games for EarthLink Network. "Either Mpath has extremely deep pockets or they'll end up putting themselves out of business."

> "Mpath appears to have given up on Mplayer as a premier entertainment network for online gaming, and clearly is struggling to find a business model that works." *—Jack Heistand, president and CEO of TEN*

Although free services are an attractive way to hook new customers, online gaming service providers must also contend with issues such as content, latency times, technical support, and interface. Many "pay-as-you play" services, including TEN and EarthLink, offer free trial memberships to lure new players, but without the proper infrastructure in place, many gamers bail after the initial trial period.

"I've pretty much tried them all, and I found Mplayer faster and easier to use," says Adam Koebel, an online gamer. "But I found TEN a lot slower to use, so after my free hours were up, I was gone."

"Although games such as *Command & Conquer* and *Red Alert* appear to play at the same speed on both TEN and Mplayer," says Eric Chew, another online addict, "I just decided TEN was too costly for me."

If you're waiting for other online providers to follow Mpath's lead, don't hold your breath. TEN, the self-proclaimed market, technology, and content leader, has raised their hourly rate from $4.95 to $9.95, and their monthly flat rate from $14.95 to $29.95. When asked if they'll change their pricing structures again, TEN spokesman Garth Chouteau said they probably would, but he pointed out that any changes would be executed as a phase of their business plan and "not a knee-jerk reaction to a competitive announcement."

In the aftershock of Mpath's announcement, EarthLink, in the hope of attracting new customers, announced their own price reduction, dropping their rate from $2.75 to $1.75 per hour.

While none of the companies will disclose precisely how many paid subscribers are using their services, most claim the figures range in the tens of thousands. But considering an estimated 20 to 35 million people are online—the majority of whom aren't playing games—you have to wonder if pontificating about market share is even relevant, given the size of this burgeoning market. And with new services—such as SegaSoft's HEAT Network, NetPlay (a family oriented service financed by Broderbund), and Origin's Ultima Online—on the way, the battle for subscribers will become even fiercer.

But if the online gaming industry is intent on providing gamers with a compelling reason to get online, they need look no further than Blizzard Entertainment to find a blueprint for success. After only two months of operation, more than 275,000 people have played over 5 million games of *Diablo* on Battle.net, Blizzard's free online, multiplayer service.

"Core gamers have known about online gaming for a while, but it has been reasonably inaccessible to the mass market," says Paul Sams, director of business development for Blizzard Entertainment. "We believe quality online gaming experiences must begin with great games."

This may prove that content—not business models or cutthroat pricing strategies—is the key to unlocking a successful online universe.

U.S. Government Dangles Encryption Carrot

But not everyone is biting at 56-bit keys… with backdoors

A huge debate is raging on Capitol Hill, regarding U.S. policies on export and encryption. The Clinton administration—along with NSA and the FBI—are pressing for policies allowing the government to access privately encrypted information and data. On the flip side, there's a contingent of U.S. senators working diligently to pass legislation that would legalize, and encourage, the use of stronger encryption technologies.

Although there are no restrictions on the use of encryption within the United States, tough export regulations limit the encryption level to only 40-bit keys. U.S. hardware and software manufacturers who wish to sell their products abroad must either conform to the U.S. encryption limits or produce two versions of the same product. So, bowing to political pressure and massive lobbying, the Clinton administration is revising its export and encryption policies to allow 56-bit key encryption. Unfortunately, Clinton's new policy comes with a string attached: key recovery or key escrow technologies within two years.

> "I have no doubt that it was the pressure of Congress, high-tech companies, and privacy advocates that dragged the White House kicking and screaming into agreeing that export restrictions should be eased." *— Sen. Conrad Burns*

Such recovery features would enable law enforcement agencies armed with a court order to decrypt otherwise impenetrable information and data during an investigation. But such backdoors invariably invite enterprising criminals or computer hackers to break in as well.

Bill Reinsch, the U.S. undersecretary for export administration, hopes that incentives such as the current proposal will result in key recovery becoming a standard feature in encryption and communication software. According to Reinsch, the ability to place wiretaps in the digital age is essential for law enforcement, but he admits that it would be politically (and, most likely, Constitutionally) impossible to limit the use of strong cryptography domestically.

Still, six companies, including Cylink, Digital, and Trusted Information Systems, have submitted product plans to the Bureau of Export Administration, and four of those proposals have been approved. Charles Williams, chief scientist at Cylink Corporation, says most of their large corporate clients like the idea of key-recovery features, which allow them to protect themselves against industrial espionage. But Williams also admits that "some of [Cylink's] customers refuse to use any system that features key recovery, and instead are purchasing solutions from foreign competitors who are not hindered by U.S. laws and regulations."

But foreign companies are already integrating stronger encryption technologies than the 56-bit keys proposed by the Clinton administration.

Clinton's insistence on key escrow didn't sit well with Sen. Conrad Burns, R-Mont., who decided to sponsor a bill promoting the use of stronger encryption techniques but prohibiting the key escrow requirement.

"I have no doubt that it was the pressure of Congress, high-tech companies, and privacy advocates that dragged the White House kicking and screaming into agreeing that export restrictions should be eased," says Sen. Burns. "But the administration's insistence on key escrow as a condition of lifting these restrictions has never been negotiable."

Burns' bill, called the "Promotion of Commerce On-Line in the Digital Era Act of 1997," or Pro-CODE, would ease export restrictions of highly encrypted computer and telecommunications materials, but would prohibit mandatory key escrow systems and the establishment of conditions for sale in foreign commerce. All products, including hardware and software, would be granted a general export license as long as the products weren't diverted for military use or used to support international or domestic acts of terrorism.

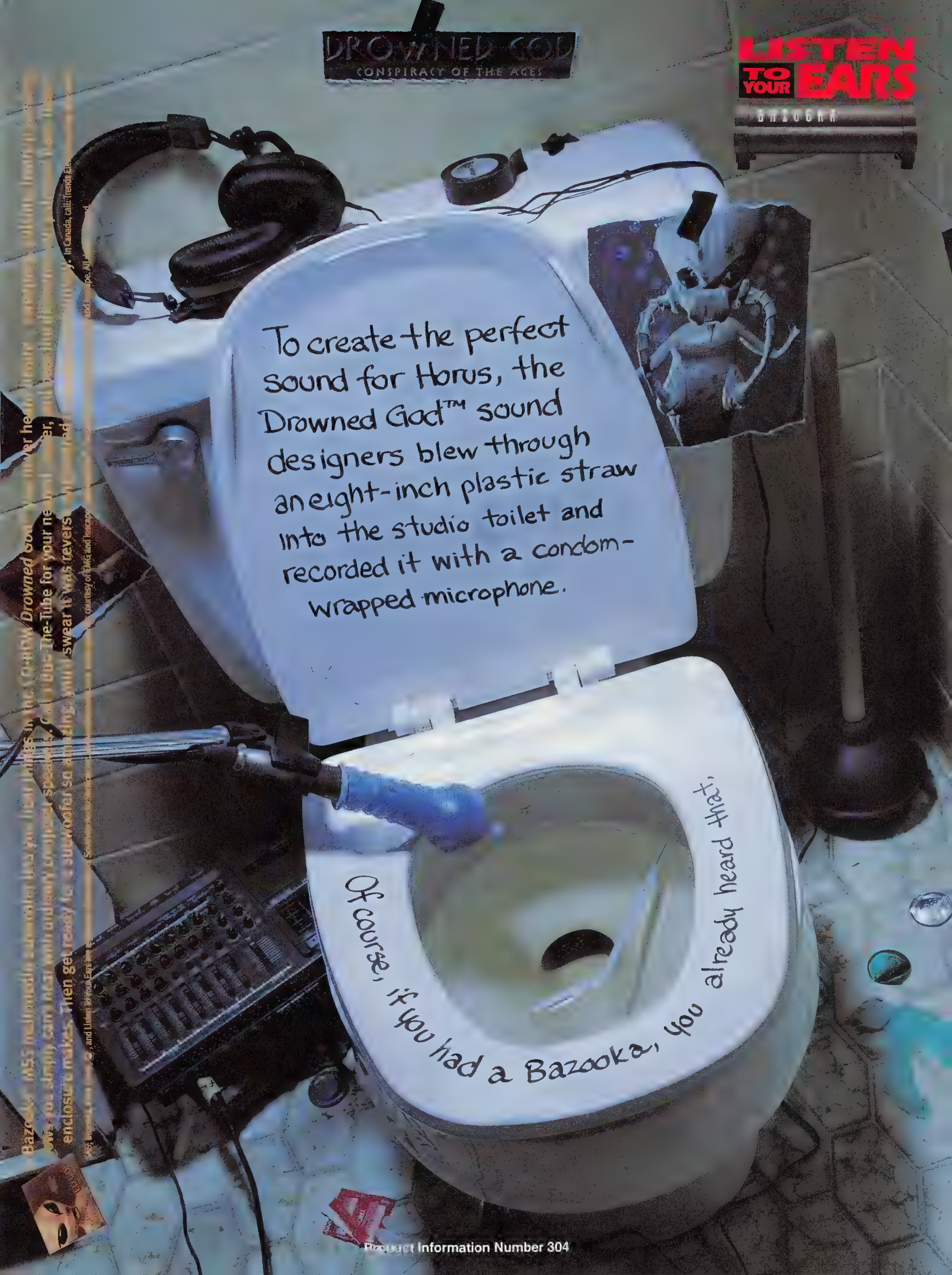
Pro-CODE has received broad bipartisan support in the Senate, and, thanks to Burns' "My Lock, My Key" Internet campaign, online supporters participated in a Senate hearing on the matter—the first interactive online event of this kind. The bill—reintroduced in late February '97—continues to make its way through the legislative process, but is garnering support from netizens and senators alike.

Sen. Conrad Burns' successful "My Lock, My Key" Internet campaign won over Congress.

"California is a world leader in high-tech manufacturing, so restrictions on the export of encrypted products can really hurt," says Sen. Barbara Boxer, D-Calif. "If our software and hardware companies cannot sell encrypted products abroad, they are placed at a great disadvantage in the international market."

The Pro-CODE bill has also earned support from more than 20 high-tech businesses, including Netscape, Novell, and Oracle. In a public letter addressed to Burns and other co-sponsors of the bill, the group stated that "the continued competitiveness and leadership of the U.S. information and high-technology industries in the global marketplace… depend upon leading-edge information technology."

But while each side is preparing for a long battle (the debate has been raging for more than four years), stronger encryption software is available—if you know where to look. PGP (Pretty Good Privacy) is a free software package easily found on the Internet, which can securely encrypt data using up to 128-bit keys (which could take decades to crack). And OpenBSD, a free operating system with built-in encryption, can be downloaded from a Canadian web site (www.openbsd.org).


DROWNED GOD
CONSPIRACY OF THE AGES
LISTEN TO YOUR EARS
To create the perfect sound for Horus, the Drowned God™ sound designers blew through an eight-inch plastic straw into the studio toilet and recorded it with a condom-wrapped microphone.
Of course, if you had a Bazooka, you already heard that.

Bazooka® MSS multimedia subwoofer lets you hear things in the CD-ROM *Drowned God*™ you never heard [illegible]
[illegible] you simply can't hear with ordinary computer speakers. [illegible] The-Tube for your nearest dealer, [illegible]
enclosure makes. Then get ready for a subwoofer so amazing, you'll swear it was reversed [illegible]. In Canada, call: Trends Ele

[illegible], and Listen to Your Ears are [illegible] courtesy of EMG and Inscape [illegible] and Inscape. All [illegible]

Product Information Number 304

pure lust

HIGH-TECH **TOYS** AND **TOOLS** WITH THE RIGHT STUFF

Crack proof

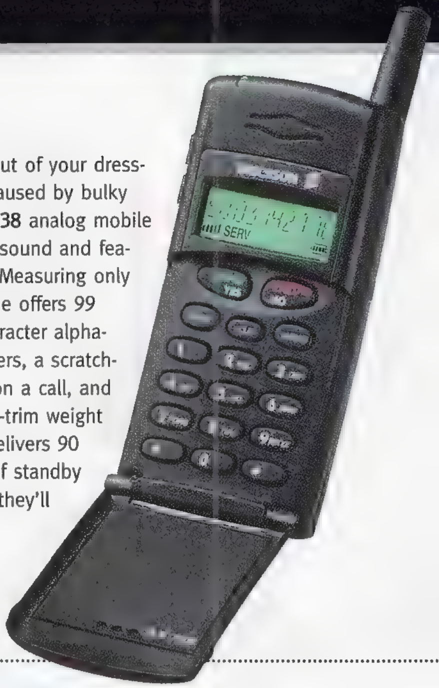
Let's face it, standard compact disc jewel cases are way too fragile. One drop and the cover cracks. Two, and the hinges are gone. But Allsop's **Strong Box** jewel cases are constructed from flexible plastic—they'll even survive a direct blow from a hammer. (Although we're not sure how that situation would arise.) The "reverse memory hub system" firmly locks the CD in place, while keeping its surface from touching the plastic. A Strong Box two-pack sells for $3.49 and double storage cases are also available.

Allsop: 800.426.4303; www.allsop.com

Small talk

Forget unsightly antennas peaking out of your dress-shirt pocket or stretched sweaters caused by bulky batteries. Ericsson's palm-sized **AF 738** analog mobile phone may be small in size, but its sound and features are the fattest on the market. Measuring only four-inches high, this $499 flip phone offers 99 speed-dial memory locations, 10-character alphanumeric name tags for stored numbers, a scratch-pad to store numbers while you're on a call, and 10-number redial. Even with its ultra-trim weight of 4.8 ounces, the AF 738 battery delivers 90 minutes of talk time and 24 hours of standby time. If cell phones get any smaller they'll have to come with watch bands.

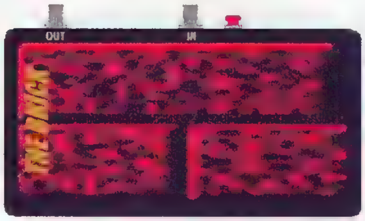
Ericsson: 800.374.2776; www.ericsson.com



All the channels, all the time

The Brick from Complete Console is a testing device that enables you to view all cable channels available on your system, including those that are scrambled such as HBO and Showtime. Of course, The Brick is only sold as a test device. It's illegal to view premium channels without paying for them. If it wasn't illegal though, The Brick would be ideal for just that purpose. It's very simple to connect and operate: Just plug it in, push a button, and in around six seconds The Brick puts your cable box into full-service test mode so all channels are viewable. No switches to fiddle with, no tuning, it's all automatic. Compatible with most cable boxes, The Brick is a steal at $199.

Complete Console Ltd.: www.dhp.com/~brick/



Global competition

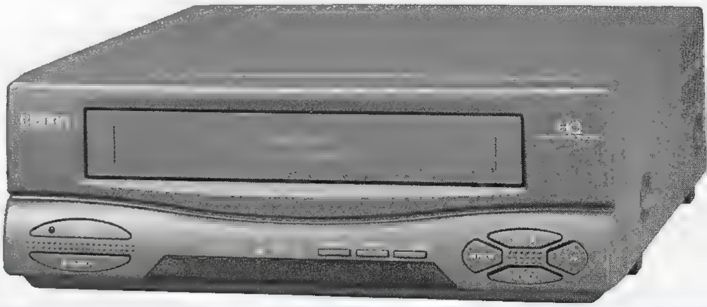
Yeah, you're the *Baku Baku* king of your block, but what about the continent? Plug Sega's $199 **Net Link** into your Saturn and a telephone line, and your game platform becomes an interface to the Internet. The Net Link is a 28.8Kbps modem, which includes a four-button mouse and web browser on CD-ROM, with proprietary technology to give you a clear image "by compensating for the reduced line count of television screens." Concentric Network Corporation is Sega's preferred Internet access provider with monthly service costing $19.95, but Net Link works with the ISP of your choice.

Sega of America: 800.329.7342; www.sega.com

Driving movie

Clarion expands what it calls its "Car Multimedia System" of mobile audio and visual equipment with its $450 **VDH9300** hi-fi stereo video cassette player. The front-loading VHS deck measures $10\frac{5}{8} \times 3\frac{1}{2} \times 11\frac{1}{2}$ inches and runs off power from the automobile's cigarette lighter with the included plug or can be hardwired directly into the vehicle's 12V battery. The unit has two-speed playback, infrared remote control, rear-mounted RCA outputs, and is "ideal for installation under the seat or in the console of a sports utility vehicle or minivan." Our advice? Put the screen in the back seat so you won't even be tempted!

Clarion Sales Corp.: 310.327.9100; www.clarionmultimedia.com



compiled by David Pescovitz

Eye spy

Paranoid? We were, after seeing Nastechnologies' line of **"covert surveillance systems."** We're talking about wireless spy video cameras hidden in smoke detectors, safety cones, electrical outlets, clock radios, eyeglass cases, purses, bricks, lamps, ties... the list goes on and on. The cameras operate on low light off 12VDC or 110VAC power and are available in color or black and white with optional audio capabilities as well. Each unit features a four-channel transmitter capable of penetrating concrete, floors, buildings, and drywall with a range of 1,000 feet—a 10 mile transmitter is on its way. Prices for these all-seeing eyes fluctuate around the $1,000 mark. Consider yourself warned.

Nastechnologies: 800.222.8045

To catch a thief

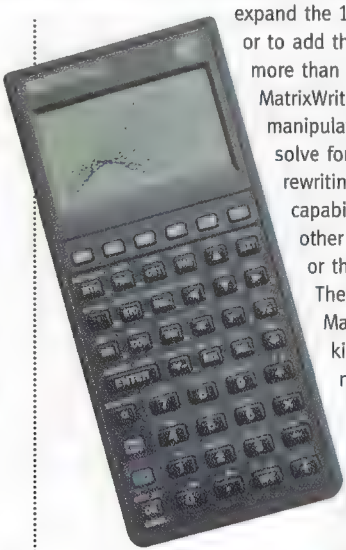
Car alarms are so common now that you probably just ignore them. Unless of course it's your car that's the one squealing. Alpine's Advanced Warning Radar Mobile Security and Digital Paging Systems will keep you in touch with your auto up to 2,500 feet away. The $220 **SEC-8205** pager features a selectable tone/vibration mode and is compatible with any of the new Alpine mobile security systems, such as the new **SEA-8081**. This $800 alarm boasts two-way communication so all operational modes and status information can be checked on the LCD remote control, a ceramic resonator dual-sector radar sensor, and an electronic, dual-stage impact sensor.

Alpine Electronics of America: 800.421.2284; www.alpine.com

Advanced abacus

A calculator with a cult? Hewlett-Packard's high-power **48GX RPN Expandable Graphics Calculator** has quite the online community surrounding it. Engineering students, computer scientists, and number nerds of all kinds maintain numerous web sites to trade tips on pushing this device to the max. Even straight from the box, the $265 48GX is a workhorse: a slot for plug-in cards to expand the 128K memory to 1.256MB or to add third-party applications; more than 300 equations built in; MatrixWriter to view, enter, and manipulate arrays; the ability to solve for any variable without rewriting your equation; infrared capability to communicate with other 48G or GX calculators or the HP Infrared Printer. There's even an optional Mac or PC connectivity kit. This is an extreme number cruncher.

Hewlett-Packard: 800.443.1254; www.hp.com



Stick it to 'em

Advanced Gravis' **Firebird 2 Programmable Joystick** puts the power to play your best into the palm of your hand. The new ergonomic jet-style handle won't wear out your wrist after extended play sessions either. This controller features 13 buttons, an eight-way, directional hatswitch, and as many as 106 keystrokes can be assigned to the buttons. Just program in the cheat and you'll only have to hit one button when the time comes. Included with the stick is a software interface that makes customization a matter of dragging and dropping. The Firebird 2 is compatible with Win95 and retails for $89.95.

Advanced Gravis Computer Technology Ltd.: 800.663.8558; www.gravis.com

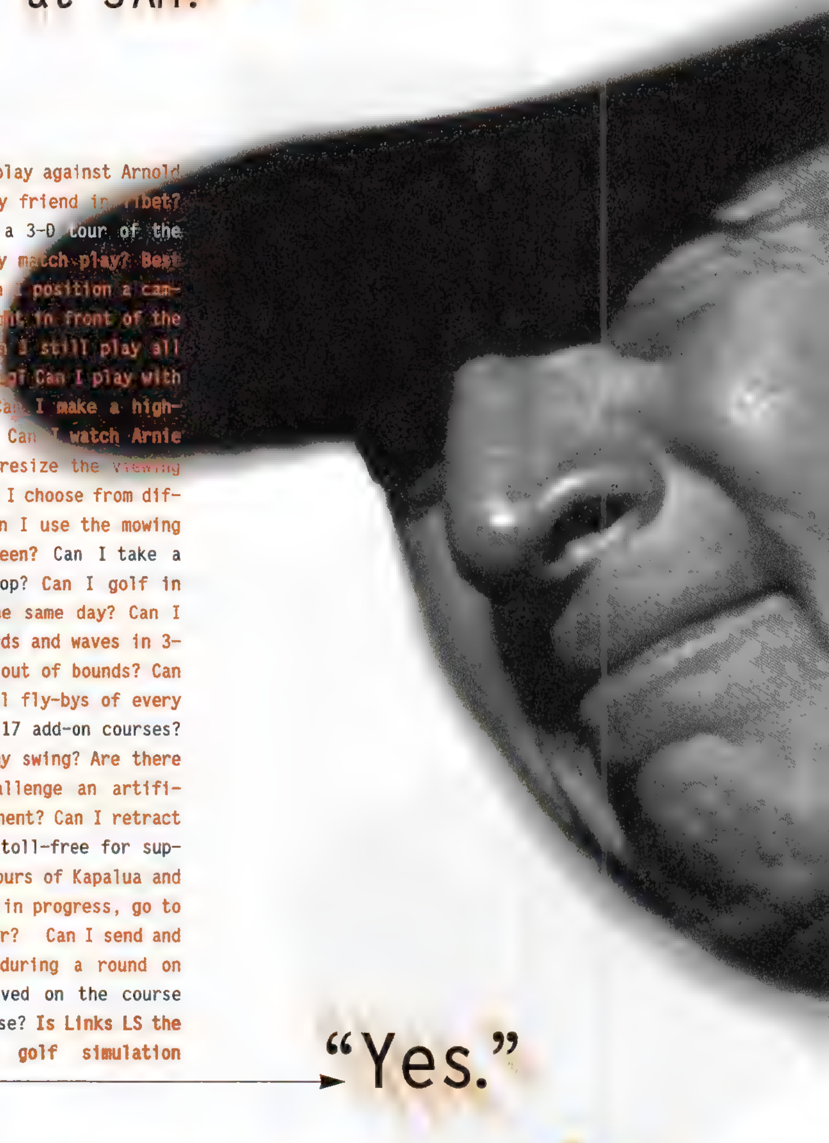
Point, shoot, style

They don't make cameras like they used to. Or at least they didn't. The **LT Zoom 105** from Olympus combines high-quality photographic technology with beautiful, retro styling to give you a versatile, but decidedly classic-looking, 35mm point-and-shoot camera. The "case free" LT Zoom 105 features a 3x zoom lens, 776-step autofocus system, auto-macro function, and a real-image viewfinder so composition is never a guess. Use the Auto-S mode and the camera emits a series of low-powered pre-flashes that dramatically reduce annoying red-eye. Bet the old cameras that inspired the design of the $419 LT Zoom 105 couldn't do that.

Olympus Optical Co. Ltd.: 800.247.9674; www.olympus.com

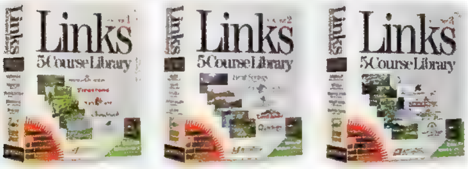
ACCESS
SOFTWARE INCORPORATED

“Can I challenge Arnold Palmer
and my buddy in Tibet
to a skins game
on Maui
in heavy fog
at 3AM?”

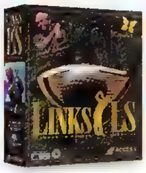


Can I golf in 16.7 million colors? Can I play against Arnold Palmer at Latrobe? Can I play against my friend in Tibet? Can either of them beat me? Can I take a 3-D tour of the Kapalua Plantation Clubhouse? Can I play match play? Best ball? Skins? Can I add in my own sounds? Can I position a camera over the ocean? Can I place a camera right in front of the ball? Won't that break the camera lens? Can I still play all the Links Championship Courses? Can I add fog? Can I play with WIN 95? Can I get 1600X1200 resolution? Can I make a high-arching wedge shot back up on the green? Can I watch Arnie react to a good shot? A bad shot? Can I resize the viewing windows? Can I see the tees break off? Can I choose from different golfers? Both male and female? Can I use the mowing stripes to read the contour of the green? Can I take a Virtual Reality tour of Arnie's workshop? Can I golf in Hawaii, Pennsylvania and Chicago on the same day? Can I get a 3AM tee time? Can I hear the birds and waves in 3-D stereo? Can I hit my ball 1/2 mile out of bounds? Can I play from there? Can I watch aerial fly-bys of every hole? Can I choose from more than 17 add-on courses? Can I watch an instant replay of my swing? Are there multiple camera views? Can I challenge an artificially-intelligent computer opponent? Can I retract the control panel? Can I call toll-free for support? Can I take multimedia tours of Kapalua and Latrobe? Can I save a round in progress, go to dinner, and finish it later? Can I send and receive text messages during a round on the modem? If I lived on the course could I find my house? Is Links LS the most realistic golf simulation ever? ⟶ “Yes.”

The NEW Links LS add-on courses



The NEW Links 5-Course Libraries Vol. 1, 2 & 3:
Playable with Links LS, Links Pro CD, Microsoft® Golf, & Links Pro CD Macintosh®



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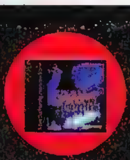


Product Information Number 80

CURIOUSER AND CURIOUSER

THE **SOFTWARE PUBLISHERS ASSOCIATION** SEES THE **GAME INDUSTRY** THROUGH THE **LOOKING GLASS** AS EVIDENCED BY THE **CODIES**

Ah, spring: time for budding flowers, romping puppy dogs, and the pointless, onanistic, self-serving absurdity of awards. Awards are everywhere: Grammys, Oscars, Director's Guild, Actor's Guild, Writer's Guild, Guild's Guild, the Alsatian Sheep Dog Critic's Circle, the Woonamachee Busy Bee Super Achiever Mug of Merit, and so on. But for sheer jaw-dropping absurdity, none can beat the Software Publishers Association's Codie Awards.

While many major publishers (such as Accolade, Electronic Arts, Origin, SSI, Apogee, MicroProse, Spectrum-HoloByte, and Activision) are not listed in the current SPA membership list, others (such as LucasArts, Access, Sir-Tech, Westwood, and id) are. Most opt out of the SPA because the tangible benefits are nebulous, and dues are high: a company with $10 million in revenue will pay about $9,000 a year, while one with $100 million must spend $28,000.

While the actual benefits are unclear, the idea is that the industry as a whole benefits from the SPA's lobbying and promotional efforts. Part of this promotion includes the annual awards for excellence in software, called the Codies, after Kathy Lee Gifford's little whelp. (Just kidding. I have no idea why they're called the Codies.)

One glance at this year's Codie finalists shows an organization sorely out of touch with the entertainment side of their industry.

> "Are the Codie Awards, who have had similar blunders in the past, worth paying attention to? It seems to me they are not." *— Scott Miller of Apogee*

In the Action/Arcade category, the nominees were: *Assassin 2015, Descent 2, Hunter Hunted, Rebel Assault II*, and *Shattered Steel*; for Simulation: *A.D.A.M. Practice Practical* (an educational title), *Grand Prix II, Indy Car Racing II, Links LS* (a sports title), and *MultiPlayer Battle Tech: Solaris*; for Sports: *Grand Prix II* (again) and *Links LS* (again), plus *NBA Full Court Press, NHL Powerplay 96*, and *VR Soccer 96*; for Strategy: *Civilization II, Close Combat, Monty Python and the Holy Grail, Robert E. Lee: Civil War General*, and *Z*; and for Adventure/Role-Playing: *Daggerfall, The Pandora Directive, Tomb Raider, Spycraft*, and *Zork Nemesis*.

The most absurd element (and there are many) of this year's list is the Action nominees. *Rebel Assault II* was a tired retread of a rail shooter and *Hunter Hunted* was a tired retread of a platform shooter. Enough scorn cannot be heaped on *Assassin 2015*, which *boot* generously gave a three out of 10 rating. *Shattered Steel* and *Descent II* were both decent, but in a year that brought us *Quake, Duke Nukem 3D, Crusader: No Regret, Terra Nova, MechWarrior 2: Mercenaries*, and *Wing Commander IV*, they hardly measure up. *Quake* broke new ground in environment rendering and *Duke* for sheer fun factor, making some of the biggest news of the year, but they were not deemed Codie-worthy.

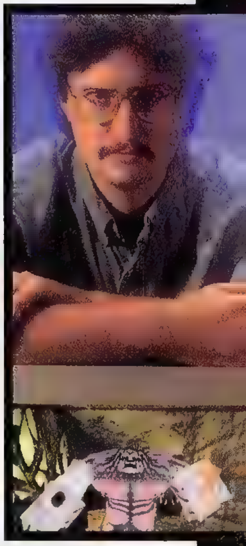
Another standout action game was *Tomb Raider*, which wasn't included in the Action category, but showed up in Adventure/Role-Playing.

Moving onto Sports and Sims we find more noggin-scratchers.

Last year was one of the richest for sims in a long time, but the most noteworthy games—*Longbow, Hind, Su-27, Advanced Tactical Fighters, Jetfighter III, F-22 Lightning II*, and *Silent Hunter*—are nowhere to be found. And will someone please explain what the hell *A.D.A.M. Practice Practical* is and why it's in this category?

Two of the best sports titles this year were *NHL Hockey 97* and *Triple Play 97*, but according to SPA members, the howling pooches *NBA Full Court Press, NHL Powerplay 96*, and *VR Soccer 96* were superior. *VR Soccer*? Was there a worse sports game published this year? (OK, maybe Microsoft *Soccer*.) And, although you might quibble with *Robert E. Lee: Civil War General* and *Z*, surely *Monty Python and the Quest for the Holy Grail* was beamed straight in from planet Zartoz. Did this mediocre example of adventure gaming have even the *faintest* strategy element to it? And where is *WarCraft II*? *Command & Conquer*? *Steel Panthers*? *Heroes of Might and Magic*? *Master of Orion II*?

Scott Miller of Apogee reacted immediately and violently to the nominees: "The SPA is the whole software publishing organization, and so these might be perceived as being kind of like the Oscars for gaming. But how could you assess a game like *2015* above either *Quake* or *Duke*? These were blockbusters in the minds of players and as far as innovations go. Are the Codie Awards, who have had similar blunders in the past—such as when *Lemmings 2* beat out *Doom* for game of the year—worth paying attention to? It seems to me they are not. This mistake very much discredits the Codie Awards."



T. LIAM MCDONALD is the all-knowing god of gaming. His mother still can't believe that he plays games for a living.

What does all this say about the SPA? Most notably that their nomination and review process is screwed. This process begins with more than 3,000 SPA member companies getting a call for nominations. Entrants then nominate their own titles. This list of as many as 1,200 nominees is reviewed by 120 "journalists and educators" who decide the final cut. These people, who lack a strong knowledge of games, make critical nomination decisions. And while non-members can allegedly be nominated, the absence of outstanding titles from non-members such as Apogee, EA, and Origin speaks volumes.

The SPA needs to start addressing not only the nomination and selection process, but also begin addressing the unique needs of the game industry (renewed government meddling, shifting markets, evolving technologies) more directly and effectively, or they will find themselves replaced by a trade organization that does. b

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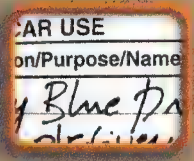
- 1cm macro capability.
- Exposure compensation.
- 3 capture modes: still, document, and continuous.

Still Mode



Document Mode

Continuous Mode

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HOME SALES
1990-1996

Product Information Number 291

DON'T HATE/LOVE ME BECAUSE I'M BEAUTIFUL...

HATE/LOVE ME BECAUSE I'M SMARTER, MORE CREATIVE, MORE CONNECTED, AND MORE SENSITIVE THAN YOU

If I told you I was a witch, you might be frightened. You'd surely think I was nuts. And maybe you'd forget that I had baby-blue eyes and ultra-blond hair and suddenly... I'd be a threat.

But I'm not a threat.

You think it's cute. Adorable. It's oh-so-sexy that a girl knows jack about computers and has an attitude. Yeah, just you keep reading. I got lots to say.

Today's little talk is about sexism online. Most of *boot*'s readers are male—at least it's the male readers commenting on my writing. (Hint: Girls, I'm waiting!) But in between praising my witty comments or my sensible statements, only one in 20 doesn't mention my picture.

Do these geeks think it's more important to me that I'm attractive to them than it is that I have a brain? It seems mighty arrogant that some boy-man should believe I'm somehow validated because he thinks I'm cute. Why else tell me? Is that the compliment you think I'm looking for as a journalist?

An example (name removed to protect the guilty): *Just got my first copies of* boot *magazine. I was flipping through, looking for something interesting, when I saw your beautiful face fly past my thumb. I backed up, page after page, expecting to find it part of some ad campaign. Nope! Just another informative column. I love the promo shot, though, with the cabling running around. It manages to convey the high techness, while adding a sort of mystery to you. Anyway, you're very good looking.*

It's about Neanderthals who still think it's cool [to] degrade me with ridiculous e-mail.

This is not inspiring. Furthermore, passing over my words as "just another informative column" to tell me about the frickin' cables around my "mysterious" face is absurd. I don't mind compliments about my looks... in the proper context. I like to be pretty. But "pretty" has much more to do with the whole of a person than their physical manifestations or a photograph in a magazine.

Men tend to think that just because women are online—in their domain—we are free to harass, because "e-mail doesn't really count." You bet your phat ass it counts! It counts as much as dorks breathing heavily into my phone or freaks on the street whistling tribal mating calls. Just because you're rich enough to afford a computer does not exclude you from the realities of sexual harassment.

Great article and great that you're so attractive!

I just got boot *and the nicest thing in it is your eyes.*

Wow, beauty and *brains!*

Oh, barf. Double barf. Triple gag barf!

Online sexism doesn't end at my *boot* column. I am very active in the VRML industry (which must be 95 percent male) and after speaking out against sexist language on the VRML mailing list, I got flamed up the wazoo. I was told that "this type of discussion doesn't belong on a technology mailing list." Told I was inappropriate. Told—by a woman even—that I should keep my mouth shut. Even though she agreed with me! You mean I'm just supposed to accept this nonsense as par for the course? No way. I'm gonna do what I can to change it. When I snapped and sent a flame back, I was triple-flamed for being extra-inappropriate.

Now, why is it OK for boys to yell at boys all day long about the most minute tech spec and call each other losers, but when a woman speaks out about sexism she's ousted without trial? Ahhh, memories of Salem. Interestingly enough, most who flamed me publicly, apologized privately. Hmmm.

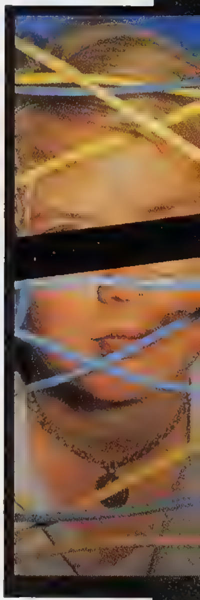
And it was not inappropriate subject matter for a technology list.

If sexism is not discussed when and where it occurs, nothing is learned. A woman programmer wrote me soon after, saying, "You were right on. Just like when a dog goes in the house—you gotta whack 'em right away and push their noses in it."

Well, I don't think I need to whack anyone, but a good reality check is important if we are to evolve. And if you think it will go away by itself, you're sorely mistaken.

Someone even suggested I take the discussion to another list. Sure, I'll just take my "issues" to a homogeneous group of irrelevant people who already agree with me.

I don't want support. I want change! Change doesn't occur within the safety of our castles, change happens when people learn. And they don't learn unless they are told or reminded that they have been hurting people. Sometimes it's the simplest things that are hardest to learn. And by the way, qualifying my writing with comments about my looks does hurt my feelings. I am not angry because I like to be angry. I'm angry because I resent feeling hurt.



SHEL KIMEN (kimen@well.com) has spent more time online than is reasonably healthy for one person and dreams in hypertext.

And this is not about hating men either, so any of you who try to put words in my mouth, just swallow them now. I'm used to that whole femi-Nazi garbage. Yadda yadda yawn to you and your quick-fix scapegoats. I love plenty of men, date a few, and have many male friends. This column is about the Neanderthals who still think it's cool to objectify women and base their judgments on superficial stereotypes and degrade me with ridiculous e-mail.

To those who manage to send me mail without mentioning the photo or asking for dates—you rock—and much thanks for being a freethinker. b

Calendar of Events

MAY

IGN
IMAGINE GAMES NETWORK

www.imaginegames.com

Date	Site	Event
Tue MAY 6	boot Net	**boot Reviews** All Boot's latest reviews will be launched onto bootNet.com. Make sure you're ahead of the PC market.
Thur MAY 15	PC GAMER ONLINE	**Talking PC Games** Chat with the PC Gamer Online editors in the IGN Palace.
Mon MAY 26	boot Net	**boot Previews** See a panoply of Boot previews on bootNet.com. For PC addicts only.
Thur MAY 29	PC GAMER ONLINE	**Challenge the Team** Play X-Wing vs. TIE Fighter against the PC Gamer editors (details will be announced on PCGamer.com).

All events begin at 6pm PST

Our Affiliates:

DUKE COSMIC 3 NUKE
www.evansville.net/~tyrant21/duke.htm

THE SERIOUS GAMER'S PAGE
DOOM QUAKE C&C MECHWARRIOR & MORE...
www.escape.ca/~tpeters/gamers.html.com

The Imagine Games Network (IGN) is an integrated network of the best computer and video game sites on the Web. Whether your primary gaming system is a PC or a console, IGN has everything you need—from up-to-the-minute news, reviews, previews, strategies, codes, cheats, downloadable demos, chat areas and much more.

Every day, one of IGN's sites hosts a special event. These include interviews, polls, contests and extra features. And they are all absolutely free.

All you have to do is check the times and dates of the events and make sure you are there to enjoy them. You'll find the URLs and events for IGN's computer sites on this page. For a complete listing of IGN events check out **www.imaginegames.com**.

PC GAMER ONLINE
www.pcgamer.com

boot Net
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WELCOME TO THE BROADBAND AGE

BLASTING **BOTTLENECKS** FOR SMOOTHER SURFING

Sometimes the Internet gets so clogged you feel like pouring Drano into your phone line. While you're trying to do something serious, such as dial into the bootNet, greedy yuppies are checking their stock portfolios, multinationals are hogging the backbone with bureaucratic e-mail, and nerds are disguising themselves as handsome avatars so they can pick up babes in VRML chat rooms.

And you have to share bandwidth with all of them.

The Internet doesn't work like the telephone system, which won't give you a dial tone if all the lines are busy. The Internet tries to accommodate everyone, no matter how much traffic there is. The telephone system is like a jet airliner: It has a fixed number of seats (phone lines), but it flies just as fast whether it's empty or full. The Internet is like an urban freeway: Traffic just keeps moving slower and slower until finally it grinds to a halt.

The giant telecom companies that operate the Internet backbones (AT&T, MCI, Sprint, etc.) are constantly laying more fiber optic cable, installing more high-speed switches, and making other improvements. The data superhighway is a major project that will never be finished. But nothing they do to the backbone will fix the most constipated section of pipe in the whole worldwide network: your pathetic little modem.

Modems have made surprisingly little progress over the years. While microprocessors, memory chips, disk drives, and other parts of your computer have grown hundreds or even thousands of times bigger and faster, analog phone modems are only about 10 times faster than they were 20 years ago. It was bad enough when data files were measured in kilobytes. Now we're trying to cram megabytes through modems that haven't kept up.

Drano won't help, but new modems will. Starting now, and gaining momentum during the next 10 years, new types of modems will offer breakthrough amounts of bandwidth. I'm not talking about the 33.6Kbps or even the 56Kbps tortoises being touted as the next big thing. These are short-term solutions that still relegate you to narrowband data rates. Nor am I talking about middleband ISDN modems.

> We're talking about 100 times the speed of today's analog modems for about one-hundredth the price of today's equivalent bandwidth.

I'm referring to the broadband modems that will launch you into the megabit age. These modems will move the bottleneck from your desktop and shove it somewhere further up the network. (There will *always* be bottlenecks, but at least this way it'll be a problem for the telecom guys.)

Some of these modems are available today—in limited areas. The catch is they require special services from your local telephone company, cable TV company, or other network provider. Prices will vary widely at first, especially in areas where there's no competition. Eventually (and, in some places, today), broadband service will cost $35 to $50 a month, including unlimited Internet access. That's $15 to $30 more than you're probably paying today for flat-rate access at narrowband rates, but it's a couple of thousand dollars a month less than you'd pay for T1 access, which is the kind of speed we're talking about.

Broadband modems fall into three categories: ADSL (asymmetrical digital subscriber line) modems that work over existing copper phone wires, cable modems that operate over cable-TV coaxial networks, and wireless modems that use small dish antennas.

Wireless broadband modems can be subdivided into two more categories: those that tap into terrestrial networks (in which the transmitters and repeaters are on the ground), and those that communicate with satellites in orbit.

All are capable of delivering data to your computer at 1.5 megabits per second to 3 megabits per second (Mbps). Under ideal conditions, some can deliver much more throughput.

By comparison, a costly T1 line delivers 1.544Mbps. To put this into perspective, we're talking about 100 times the speed of today's analog modems for about one-hundredth the price of today's equivalent bandwidth. If PCs made the same kind of leap, you could buy a machine with a 15000MHz processor, 1600MB of RAM, and a 100GB hard drive for around $20.

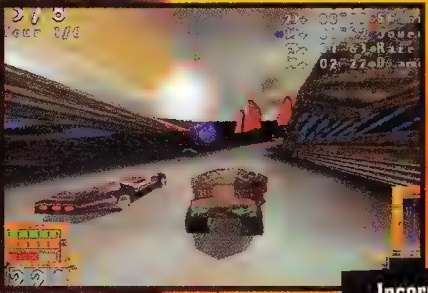
TOM HALFHILL is a senior editor at *Byte* magazine and the author of two computing books. He first became interested in computers during the disco era.

Barring unexpected breakthroughs, that's far more progress than our personal computers will make over the next decade. Bandwidth, not processing power, will drive computer evolution in the near future.

Will these miracle modems really unclog your pipes or are they a pipe dream? I promise they're for real. A few hundred thousand lucky people already have access to broadband modems, and thousands more get the opportunity every month. As with all relatively new technologies, there are still wrinkles to iron out, and the early adopters are the guinea pigs. But it's going to happen.

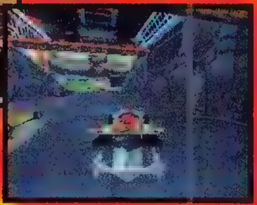
Someday you'll brag to your grandchildren how you slogged through the Internet at a pitiful 28.8Kbps.

The Fastest High-Speed, Internet-Direct Racing Game on this Planet...or Any Other.



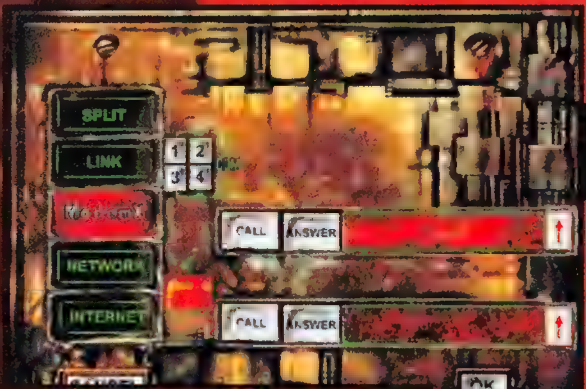
...the most explosive, hypersonic, nitro-burning, futuristic game ever is driving cutting edge technology to the outer limits:

Incorporates state-of -the-art MMX™ technology. Also runs on Pentium® processors with MMX™ technology and Pentium® processors 100 MHz and higher.



Neck-jerking speed...playable at up to 32 frames per second! (up to 80 fps with a 3-D accelerator card)!

16 tracks (plus new tracks downloadable over the Internet), variable damage control, customizable cars and three levels of difficulty.



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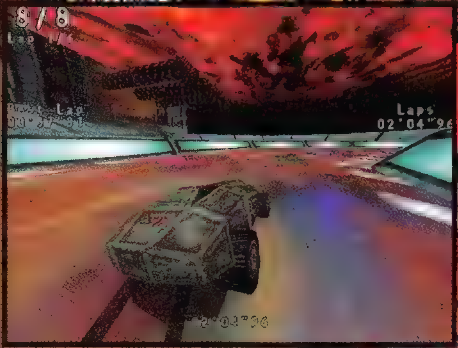
Race others over the Internet, against highly advanced artificial intelligence, your own recorded "ghost" or someone else's.

Pre-calculated position engineering reduces latency over the Internet!

Revolutionary website includes player matching, chat rooms, ranking lists, downloadable and uploadable ghosts, tracks, cars...and more.



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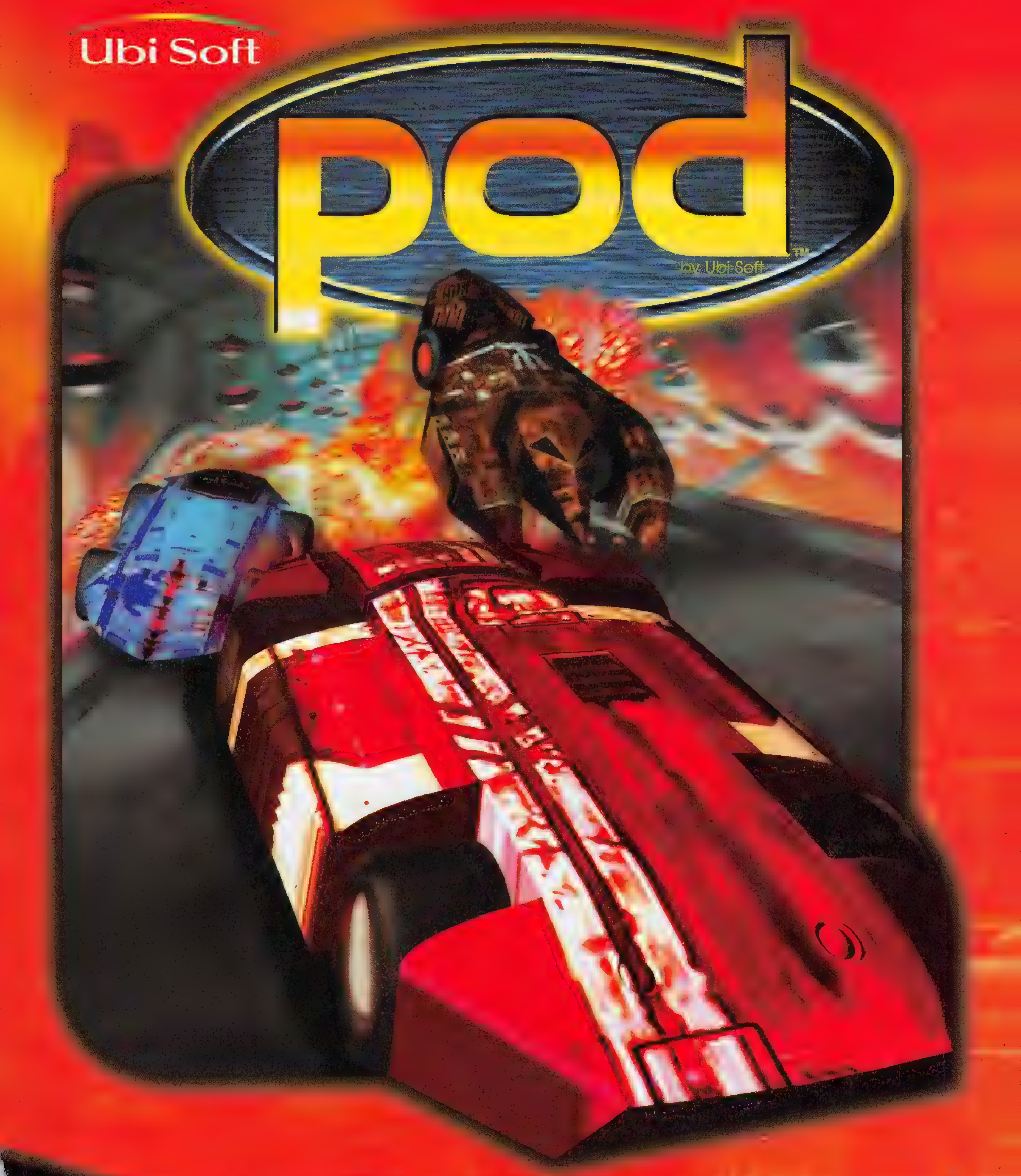

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KIDS TO ADULTS
K-A
CONTENT RATED BY
ESRB

Designed for
Windows® 95

DOLBY SURROUND

intel
MMX™
DESIGNED FOR

Product Information Number 232

Lip

THE BOOT INTERVIEW

She struck a pose in *Playboy* in order to draw all eyes onto the first offering from her company, Black Dragon. But does the self-proclaimed marketing genius **GILLIAN BONNER** really have the savvy it takes to break into the male-dominated computer industry? Her first title, the sexy FMV romp *Riana Rouge*, was just acquired by one of the industry's hottest publishers in a top-dollar deal, making her a bona fide player and a true...

boot: Many would say you sold out women by posing for *Playboy* to further your company, Black Dragon. How do you respond to such criticism?

Bonner: Women, whether they realize it or not and whether they accept it or not, are the most sexual creatures on earth. And the most sexually powerful creatures on earth.

There is nothing wrong with nudity. Of course some men are going to degrade it. They're going to make it dirty; they're going to make it degrading. But it depends on your perspective and how you look at it. I think it's beautiful.

I didn't sell out women. I empower women. Get real.

boot: How much of Gillian Bonner is there in the *Riana Rouge* character?

Bonner: Quite a bit. Inadvertently. Being able to produce this has been a huge growing experience. It's like I'm a different person than I was five years ago. But like me, this character evolves from somebody who has no self-esteem, no power, and by the end she's a kick-ass superhero chick with total control of her sexuality... and she's proud of it. Maybe I'm not a superhero chick now, but I definitely have gone through a lot of evolution in the last five years and so maybe there's more of me in there than I think.

boot: So who is Gillian Bonner now?

Bonner: I have absolutely no idea. I would say that I'm a man in a woman's body. An entrepreneur who has a vision.

boot: What's that vision?

Bonner: To get a message out there. And the perfect medium to get the message out there is in the game industry. Right now I think there's a huge hole in the industry for that type of thing.

boot: And what's the message?

Bonner: Be in charge of your own sexuality, have no fear about it, be aware of your spiritual self.

boot: You've programmed, you've modeled, you're an established artist. What else don't we know about you?

Bonner: I'm a marketing genius. That's what I really like to do best.

boot: Marketing?

Bonner: Yeah, because I get to go out and interact with people. I'm perfectly capable of doing a lot of the artwork in my games and I did, because of my limited resources. But that's not what I'm best suited to.

boot: Do you expect to delegate matters more for the second game?

Bonner: Totally. We've got a rough budget and know pretty much what will be required as far as resources. And I couldn't do it all in-house. I would prefer to outsource a good 75 or 80 percent of it, and just have creative control.

boot: One of the hottest publishers in the industry just helped you buy out the *Riana Rouge* contract from Konami and you're negotiating a multimillion dollar deal for the project. Why are you switching teams?

Bonner: The new publisher is just awesome. They're willing to take the risk. They *believe* in my vision; they believe that this new genre is going to be *the* next big thing.

boot: What was the budget for the first title?

Bonner: About $800,000.

boot: And the next title's budget will be?

Bonner: Two-point-something million.

boot: Who do you admire?

Bonner: Very few people. Actually, I happen to admire the CEO of Eidos. I like him as a person. He's ruthless, shrewd, and a force to be dealt with. But at the same time he has a good heart. So many people look at him and don't see his heart but I *feel* people's hearts. And I knew right away that he's a good guy.

boot: Do you think you'll still stick with PC development?

Bonner: To be honest, I'm not sure how well this game will sell. It'll depend on the marketing put in. And apparently the new publisher is willing to put in quite a bit. It's not going to compete with *Doom*. It's not an adrenaline-type play. But even if this is a total failure, I'd probably continue.

boot: So you have faith in this company?

Bonner: I have faith in their vision. They believe creativity lies in the hands of small developers who have a lot of control.

boot: You still have creative control over the title?

Bonner: Absolutely.

boot: You're not willing to relinquish that?

Bonner: Nope.

boot: Under any circumstances?

Bonner: Well, I'm willing to take criticism and compromise, obviously. When you're entrenched in something you can't always see the flaws, and if somebody comes in and says "Ugh" then it becomes obvious to you. So I'm open about changes, but if I'm dead set about something, there's no way they're going to get me to change it.

boot: Do you think there's an untapped market for female-oriented games?

Bonner: Of course. The industry as a whole has been male-oriented and it's been difficult for women to get over that. There's a lot of fear associated with computers and women are taught by society that they can't do it, it's a man's thing, and they should fear it. Once people get over the fear—especially women—they'll be right in there. And it's already happening.

boot: What do you think of the titles such as Hasbro *Barbie Fashion Designer* and that kind of stuff?

Bonner: I honestly haven't played any of them, but it's wonderful that females have

PHOTOGRAPHY BY MARK MADEO

MADONNA Megabyte

I'm **sure** people will say that I'm **degrading** women and the **feminists** will go frigging crazy, but they're **dead wrong**. This story is all about **empowerment**.

that opportunity. It'll get them over the fear and it'll get them on the computers. And then it'll open the doors for other less stereotypical titles.

boot: So you aren't afraid that titles such as *Barbie* are going to be typical of female-oriented software titles down the road?

Bonner: Not necessarily. Obviously there'll still be stereotypical female games, but I think that's just the door opening to all sorts of stuff for women. We have a series in mind that's specifically directed at women. It's content is as sexual as you can get and women are just going to eat it up.

boot: Can you elaborate?

Bonner: No, it's a secret! But it's perfect for women because they can feel comfortable going and buying it and not feel embarrassed. That's a big part of it. You know women have been taught to be embarrassed about sex, which is so ridiculous.

boot: You've previously labeled *all* software as pornographic.

Bonner: Everything that *I've* seen. And I'm not saying that I've seen it all, of course. But it's usually very cheesy and very degrading, and there's not a lot of content associated with it. They just make it so trivial and ridiculous most of the time. It's not something that turns me on. It's just crap.

boot: What games have you played that had potential but failed to deliver?

Bonner: I don't know. I read reviews but I don't have the time to play all the games that come out. I only play the really popular ones. So I don't even know. But from what I've read, most of the games are all the same.

boot: They're all 3D polygon-based first-person shooters?

Bonner: Exactly. And no matter how hard they try, it's never going to be as good as the original. Maybe *Duke Nukem 3D* is, but that's kind of a cheap game.

boot: You don't like *Duke Nukem 3D*?

Bonner hopes women "will get over their initial fear" and be attracted to the game's empowerment angle.

Bonner: Oh, I don't know. It's very similar to *Doom*, but there are elements that were degrading to women.

boot: You don't think the same criticism will be leveled at *Riana Rouge*?

Bonner: Well, I'm not sure. Who's to say what people will criticize? I'm sure people will say that I'm degrading women and the feminists will go frigging crazy, but they're dead wrong. We're far from that. Very far.

This story is all about empowerment of the character. And the choices that the player makes empower the character if they're the right choices. Of course, the right choices will get you further along in the game. And if there's a wrong choice, then she's either going to die or go nowhere. So yeah, we have sex. Yeah, we have violence. But it's never gratuitous.

And the sex is there for a reason. It's not gratuitous either. It has to do with the story. The player chooses when to engage—or try to engage—in sexual interaction and it's not always the right choice. You get slammed sometimes; you're just so wrong. But when it's right, it's fabulous. And there are beautiful images associated with it. Not degrading and silly images.

should I waste this guy??

Gillian Bonner wore many creative hats while making *Riana Rouge*, including her role as the skimpily clad title character in the game's FMV sequences.

boot: Is there nudity in *Riana Rouge*?

Bonner: Yeah there is. There's no full-frontal nudity. There's about the same amount as an R-rated movie. I've tried to get the feeling that I've shown a lot when in actuality we didn't show much. But the person who's watching or playing gets so wrapped up that they think they've seen so much more. It was just the whole sensuality of it.

boot: Who's the target audience?

Bonner: I did that *Playboy* deal, and the market for that is 18- to 35-year-olds and maybe even 45-year-olds, I'd say. So it's the same market as that. Typically male, people who want to see sexy stuff.

In future titles I hope women will get over their initial fear and judgment and will maybe be attracted to the titles because of the female heroine and how powerful she's become and how it's not a degrading thing.

boot: Would you want to play games like *Riana Rouge*?

Bonner: When I've taken the characters to CG and the environment to CG, where you have absolute control of the character, *that's* going to be the type of game I want to play.

Like *Tomb Raider*. Although *Tomb Raider's* is so boring.

And I told them, I said, "Look, it was a good first try." But you know it's good technology, but it could be so much more exciting. That's the way I'm thinking of going with the sequel, and that would be the type of game that I'd be more likely to play than *Riana Rouge*, if only because of my adrenaline junkie tendency. If I heard about *Riana Rouge*, I'd want to see what we did. And I'm sure I would be somewhat impressed, at least by how we push the envelope.

boot: What technology do you see as being important in 1997?

Bonner: I saw this when I was out west just this past week, the ability to create realistic human models. That's going to take us to another level. Having people we can relate to as humans and not just CG characters. They're getting very close. There's still a little bit of weirdness, but some were amazing.

And you know, previously being in the hardware industry, all I remember is that I could never keep track because there was always new stuff coming out. It's just going to continue and not only is it going to continue, but it's going to get exponentially faster as we approach the next millennium.

boot: What about the multiplayer aspects of gaming?

Bonner: They're of huge importance, and the Internet will play a giant role. The bandwidth is just going to keep going straight up and people are going to be able to interact where there is no sex and no gender, no race. It's whatever you want and whatever you create and whatever you feel like being. And the Internet is going to allow that. It will allow people to play out their most hidden fantasies.

We're thinking about that for the sequel. But it'll be difficult to do an online version, given the production for *Riana Rouge II*, especially if I produce it similar to *Tomb Raider*.

Now something like *Diablo*... perfect, perfect! Play the hell out of that thing on the Internet, but it also depersonalizes because you're looking from this far away view and you're not really connecting with any of the characters. So the technology's going to have to change before you can really feel connected with what you're doing online.

boot: Do you think there's a glass ceiling for women in the PC industry?

Bonner: What do you mean by "glass ceiling"?

boot: Well, there haven't been a lot of women producers. The industry generally is male-dominated.

Bonner: Oh, that's all changing.

boot: How do you think it's changing?

Bonner: Right now everything in this world is changing. And in a positive way, I really believe. And that includes women overcoming a lot of oppression in a lot of areas. People are becoming way more open-minded. And huge opportunities are going to open up for women. This is just the beginning of a whole new age of enlightenment. And women are going to be a big part of that.

boot: Is Black Dragon in a position to help that new age of enlightenment along?

Bonner: Oh, absolutely. We're obviously willing to take the risk now, where no one else is. And I'm sure that the opinions about what I'm doing are certainly different now than they will be in even a couple of years. Right now I'm the risk taker, the one going out and doing stuff, but soon more people will be open to doing that sort of thing and even cooler stuff. It's just the very beginning.

boot: Are you familiar with Senator Joseph Lieberman?

Bonner: Vaguely.

boot: He's a senator on a crusade against excessively violent games such as *Quake* and *Doom*. He's going to try to get restrictions on sales to minors, things like that.

Bonner: Minors should be protected. They really should. And violence... it's so funny that we can put out games that are so violent and so over the top.

boot: What kind of game would you classify as over the top?

Bonner: Well, *Quake* and *Doom*. Those are ultra-violent. Of course the blood is not as realistic as our blood, but it's still cause and effect. They shoot and there's this huge bloody massive thing happening. I'm not sure what effect that's going to have on kids. Maybe it'll make them callous to violence, which is not a good thing. So I don't think games like *Doom* and *Quake* should be sold to minors.

But at the same time, I'm totally anti-censorship. I mean, censorship is so Dark Ages! [Sen. Lieberman] needs to get real! He'll just run into a dead end because people's opinions are changing and people like him are on the way out.

boot: With your notoriety, do you get a lot of opposition from other developers when you go to trade shows?

Bonner: No. My affiliations have been really limited. I go to shows mainly looking at the technology and the concepts; and I've not been impressed with the concepts at all. I also look at the possibility of teaming up with people. I'm always looking to find people who have a vision along the same lines as I do.

We demoed *Riana Rouge* at E3 last year and got a huge amount of press, but Konami promoted me less as the president head of this development at Black Dragon, but rather as a Playmate.

boot: How did that make you feel?

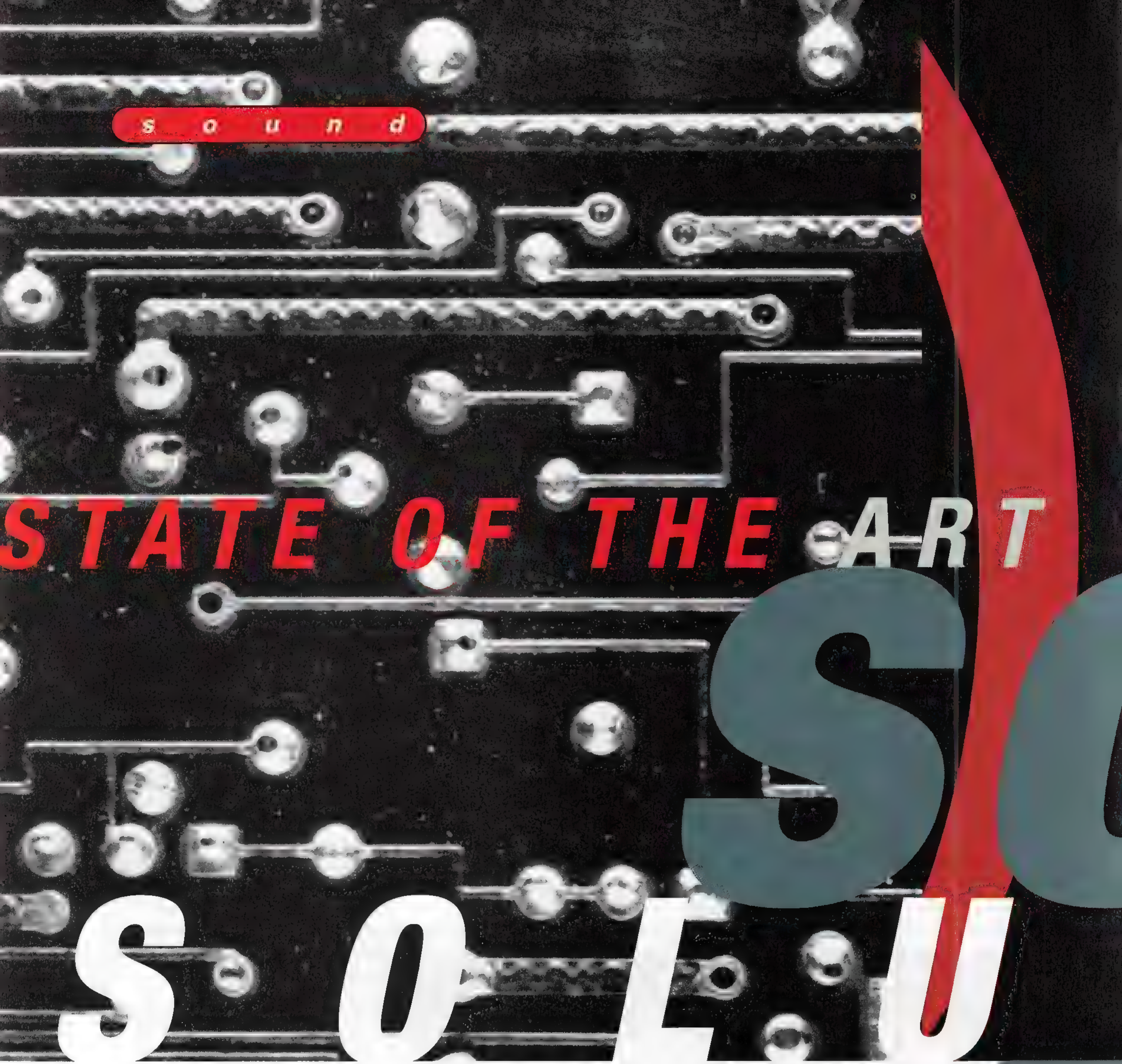
Bonner: I guess if it attracts people and they become aware, then I'm... whatever.

boot: So as long as people know about the new game?

Bonner: Yeah, and know that it's not just this sex image, that there's more behind it. If they can't get past that then they're going to be stuck in that box forever and I don't have any reason to be worried about them because they're not evolved. A huge number of people are that way and I just have to accept it. And I have. ▮

Regarding her company, Bonner says, "We're obviously willing to take the risk now, where no one else is."

different person than I was five years ago. But like me
this character evolves from
somebody who has no
self-esteem to power
and by the end she's a
superhero
sexuality



STATE OF THE ART

S O L U

SO

An interesting thing happened to the sound of the PC a few years ago. It looked as though the new 16-bit wavetable sound cards were going to launch a revolution and turn the box that went beep-beep into a monster multimedia machine.

Alas... history, commerce, and not-quite-there-yet technology conspired to fizzle the revolution before it started. Gamers wanted Sound Blaster compatibility, wavetable was expensive, and good sound sucked enough MIPs to slow any application. But lately, forces have converged into a critical mass and it's about to make some really good noise on our PCs: great-sounding, consistent music; interactive, immersive, moving 3D-surround effects; movielike integration of sound and picture; and more. It's going to make gaming and multimedia more intense than ever before.

What's driving this train? Let's take a look behind the scenes.

DirectSound and DirectMusic

For all its graphical improvements over DOS, the first version of Windows actually made it harder to develop multimedia applications. Even today many games are written in DOS. To heal this rift, Microsoft's been developing DirectX APIs. The primary goal of these developer tools is speed: the kind of high-performance, real-time applications that power users are looking for.

DirectSound, the audio component of DirectX (on this month's *bootDisc*), gives game makers a technically straightforward way to do amazing stuff: change the apparent location

*You've got the **fastest** 3D accelerator card.*
*You're packing serious megahertz in your **dual** Pentiums.*
*Your CD-ROM drive is **spinning** at sonic speeds.*
*Your MMX is straight-up **dancing**.*

*But your sound card really **sucks**.*

*Before you **stick** an ice pick in your ear, check out our **in-depth report** of the sound technologies and the companies that'll be pitching them.*

ound

BY TIM TULLY

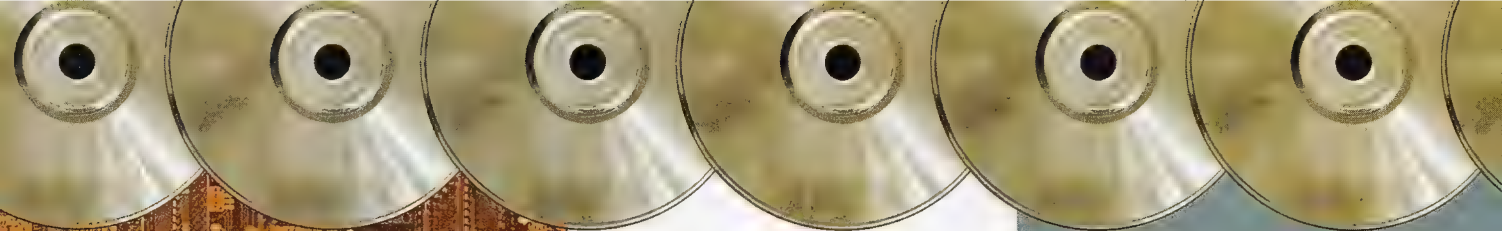
TIONS

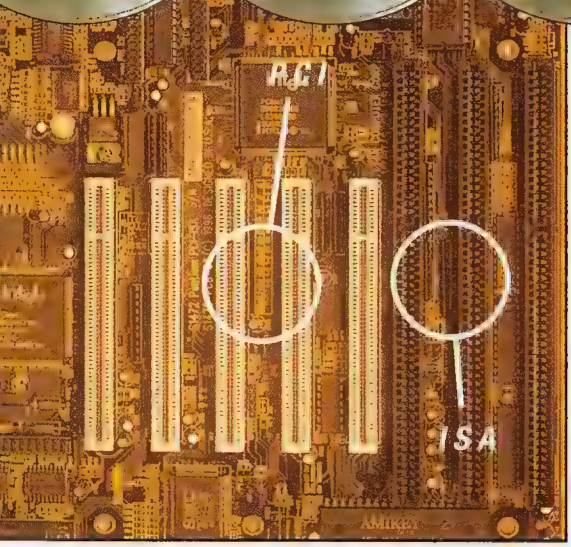
Do it!

The bootDisc contains samples from the cool new 3D technologies mentioned in this month's feature. No need to install software. Simply launch this month's bootDisc and follow the Features buttons to the Sound Feature. Once there, simply click on the button next to a 3D sound sample to hear that technology.

of a sound source in three dimensions—up and down, back and forth, left and right—and add other effects that add up to genuine three-dimensional sound. DirectSound also lets developers create multiple buffers from which sounds can be played within 20ms of being called. This means sounds play in tight synchronization with what you see on screen, which translates into far more realism than any previous PC technology. DirectSound also gives applications easy access to any acceleration your sound card may have, giving you the full advantages of your souped-up system.

Coming soon (really) is DirectMusic, the DirectX extension that should realize the potential of your sound card's wavetable synthesizer. (Wavetable technology has great potential, but since each sound card has had unpredictably different sounds—and pretty generic ones at that—application designers tend to ignore the synth in favor of WAV files.) DirectMusic will open new capabilities that solve many of the problems with MIDI on the PC. DirectMusic's software synthesizer engine, developed by Microsoft, will automatically kick into action if you don't have a wavetable synth.





DirectMusic is also promising a way to play high-quality, low-bandwidth music over the Internet, providing some really interesting musical interactivity on web pages. The DirectMusic API had not been released at press time, but products that will take advantage of it are being released.

The PCI Bus

The second technology that is opening up audio possibilities is probably in your machine: the PCI bus. When used for sound, the PCI bus can provide up to 10 times the performance of the ISA bus where sound cards traditionally reside.

The ISA bus is slow and requires a good sound card to do a lot of work, which, as always, is expensive. The possibilities of a PCI-based synth, on the other hand, are most intriguing. Among other things, the PCI bus can accommodate several simultaneous audio streams and allow such processing as 3D filtering and mixing on the sound card. On the ISA bus, this all has to happen on the CPU and then get sent down the DMA channel to the card. More delays. Additionally, when an ISA bus performs audio DMA transactions, the CPU does nothing until the transaction is done, a particular waste with today's fast CPUs. The PCI bus is smart enough to do its own transfer while the CPU does other things.

Between the adoption of the PCI bus and the development—albeit slow—of the DirectX APIs, the system-level stage is set for big changes. But one other developing technology, more directly on the audio side, is going to make a difference: 3D.

Old but New: The 3D Audio Battles

It's far from new, and it's certainly seen its share of emperor's-new-clothes implementations, but judging just from the number of industry biggies jumping on this bandwagon, 3D audio may be ready to break out.

Until recently, companies such as QSound and Dolby used their own versions of 3D audio to good, if not always spectacular, effect in music CDs, movies, and even some TV scores. But on the desktop, most 3D technologies—designed simply to widen a stereo field, or even a mono soundtrack—have problems: cheap or ill-positioned speakers; a small sweet spot in which you have to sit submissively to get the full effect; and the annoying tendency of sounds to pop up suddenly behind your head, giving a disquieting sense of being stalked by some malicious trombone.

But the 3D support designed into the DirectSound API has proved to be fertile ground, both to companies that are using it and working around it.

Aureal

Aureal Semiconductor (**www.aureal.com**), a company formed from the original Media Vision and R&D innovator Crystal River Engineering, is one of the first to implement the true, interactive, positional 3D surround sound made possible by DirectSound and the PCI bus.

A3D is the Aureal technology that lets you hear—through headphones or even a decent pair of stereo speakers—an audio environment where sounds can completely surround you. Sounds are not tied to the simple left-right of a stereo field, or even the left-right and back-to-your-ears of earlier 3D versions, nor is their placement arbitrary. A3D sounds can come from any point on a truly three-dimensional set of x,y,z coordinates. Even more fun, A3D sources respond: You can move through a group of visual objects, for example, each emitting its own sound; and as you move, the location of the source of each sound changes. You can hear sounds travel beneath your feet, up into your face, around behind your head, or over the horizon in completely realistic response to your changing relation to the visuals.

They call it "immersive," and it is.

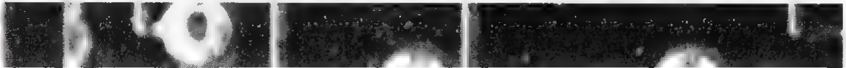
Also, unlike some 3D schemes, no

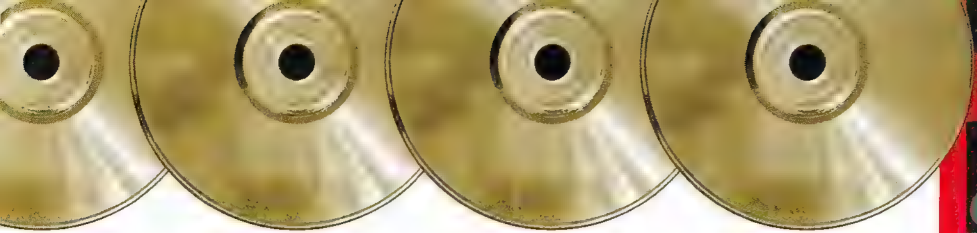
A3D on the Rise

These game developers are integrating A3D support into upcoming titles:

1. ***Acclaim Entertainment***
2. ***Activision***
3. ***Eidos Interactive***
4. ***Electronic Arts***
5. ***Epic MegaGames***
6. ***FASA Interactive (VWE)***
7. ***Incredible Technologies***
8. ***Intervista Software***
9. ***Try the A3D-enabled WorldView 2.0 VRML browser plug-in on this month's bootDisc***
10. ***LucasArts***
11. ***Maxis***
12. ***Probe Entertainment***
13. ***Psygnosis***
14. ***Rocket Science Games***
15. ***Sierra On-Line***
16. ***Spectrum HoloByte***
17. ***Virgin Interactive***
18. ***Westwood Studios***
19. ***Creative Labs*** has developed its own positional 3D technology through its development arm, E-mu Systems. According to Creative representative Micah Stroud, the technology is "tuned and ready to roll." Stroud says that any Creative product using their E-mu 8000 chip—which includes everything they've released in the past three years—will support the 3D sound. But this is war and Stroud points out, "We've been shipping our API for the past year or so, and a lot of developers are interested in implementing it but are still undecided about who they'll support."

TRY IT ON THE DISC





pre-encoding or subsequent decoding of the sound is necessary. All the processing happens interactively, in real time.

Aureal has licensed A3D to card makers such as Diamond Multimedia Analog Devices, Rockwell International, and Oak Technology. Diamond is the first with its Monster Sound PCI card slated to be available in April for an estimated $179. It will support A3D, DirectX, and PCI bus and play up to 24 audio tracks.

RSX 3D

If you need more convincing that positional 3D is the next big thing, be aware that Intel has released RSX 3D (demo at **www.intel.com/ial/rsx/www.intel.com/ial/rsx/**). The latest version of Intel's Realistic Sound Experience is interactive, positional 3D like the technology from Creative and Aureal, but it runs completely in software.

Like the other implementations, RSX 3D uses the audio science of Head Related Transfer Functions to position multiple sounds in space, and a technology Intel calls "transaural cross-cancellation," to make it work with either headphones or speakers.

Intel has big plans for the Realistic Sound Experience: specifically, the Internet. RSX 3D supports URL-based sound sources and streaming audio. In addition to interactively allowing objects to accept and process data in real time, RSX 3D handles multichannel audio with multiple sample rates, and provides effects such as reverb and Doppler-shift (the physical phenomenon where a sound whose source is approaching you slides up in pitch, and then down as the source moves away—think of a passing train whistle). RSX 3D can also be applied to MIDI sounds, and it supports VRML 2.0.

Spatializer

Spatializer, whose original stereo field-enhancement technology is one of the more satisfying multimedia implementations, is taking a tack that could prove popular. Spatializer's Digital Virtual Surround-5.1 (DVS-5.1) lets you play Dolby Digital (Surround AC-3) from only two stereo speakers or headphones.

AC-3, developed for the theater and home theater, normally requires a 5.1 speaker system. But DVS-5.1 doesn't need a subwoofer, left or right rear speakers, or a center speaker. It processes the signals normally going to these speakers to recreate the 5.1 effect. Spatializer is aiming DVS-5.1 at such near-future, high-density media as DVD, DSS, and HDTV. Since Surround AC-3 is the audio standard for DVD, Spatializer expects to see DVS-5.1 work on AC-3-encoded titles, music, and videos. It can run on cheaper DSPs running at approximately 10MIPS, and is designed to offer a wider sweet spot than the older technology.

Q Sound

QSound Labs' (**www.qsound.com/**) QSurround hoes a row similar to Spatializer's by playing Dolby AC-3 audio across a range of playback systems from a stereo pair to full 5.1 systems. It creates "virtual speakers" to fill in the gaps on smaller systems, and is designed to bring 3D effects to smaller budgets.

QMixer95 uses the DirectSound API and MMX architecture to deliver interactive, positional 3D for games and multimedia, and works with the original QSound to optimize playback on headphones and stereo speakers.

IQ is QSound's software 3D-audio enhancer for streaming audio from the net and adding interactive positional 3D. IQ supports RealAudio, Shockwave Audio, and Xing StreamWorks in Netscape *Navigator* and Microsoft *Internet Explorer*.

Goodbye Mr. Chips

While 3D surround is a big issue, some of the bigger players are attacking other fronts. One of these is the single-chip solution. As single-chip functionality grows, manufacturers are seeking to consolidate operations. The effect is lower cost solutions that chew up less CPU real estate and are easier for customers to use.

Doing the MIDI Thing at S3

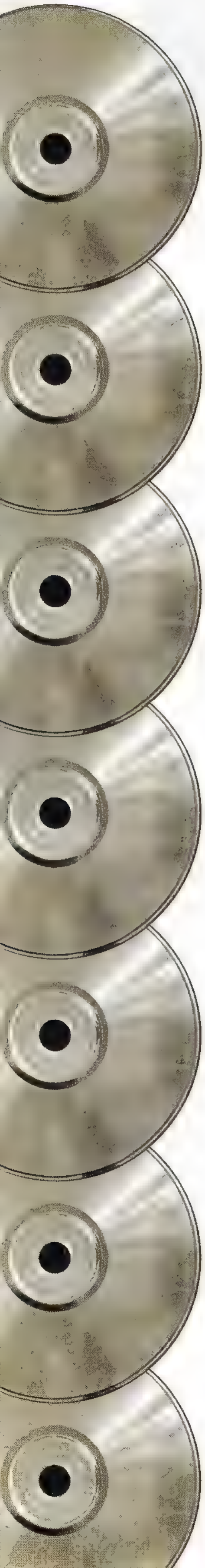
One of the biggest effects of the speed of the PCI bus will be to boost the MIDI side of PC sound hardware, and S3 (**www.s3.com**) is pushing that envelope.

The ISA bus has a high latency—it's slow—and cannot pass wavetable sounds from system memory to the sound card fast enough for effective playback. Unless it has an expensive ROM chip to store wavetable sounds. A synth on the PCI bus, on the other hand, can suck samples out of system memory plenty fast, requiring no ROM storage, and cutting the cost of wavetable in half. It's also possible that a single, PCI-compatible chip that performs all the usual functions of a sound card could reside right on the motherboard, incurring none of the costs of an add-in card.

This consolidation does something else as well. Before being loaded into system RAM for playback, wavetable sounds can be stored on hard disk or CD-ROM, and are in essence infinitely extendable. In fact, the DirectMusic API is designed to let a game download sounds that have been custom-designed by the game developer. Your card's synthesizer can play these along with, or instead of, its factory sounds, and they might be musical instruments, sound effects, or voices. This is the concept behind the MIDI Manufacturers' Association Downloadable Sample standard (DLS 1.0) and S3's SonicVibes.

In designing SonicVibes, S3 looked at hundreds of MIDI files from all over the world and analyzed them to determine General MIDI (GM) patch frequency.

*For the **first time** in a few years, it's **beginning** to look like PC **games** and **multimedia** have the **potential** to **rival** the media **quality** we expect from **home-theater TV** and **movies**.*



This allowed them to design their own GM set, giving the most frequently used patches more, larger, and hence better-sounding samples.

SonicVibes is a chip that can act as a single-chip system on the motherboard or work on a sound card. It has a flexible synth engine that can do both FM and wavetable synthesis, and is hardware compatible with the Sound Blaster. It uses system RAM to provide the unlimited sound palette specified by DirectMusic and amounts to a very capable, low-cost solution.

Renato B'Orfani, S3 product marketing manager, points out that downloadable sounds create consistency in playback. "Now you can use the synth engine to be an audio playback engine for sound effects or voice," he says. "Tie this to the Internet and think of using MIDI commands to trigger sounds on another player's machine across the net." MIDI commands are tiny bits of data, and once the set of game sounds is installed on each machine, you get consistency, quality, and speed.

Yamaha

Yamaha (**www.yamaha.com**) has been involved in PC sound from the beginning, and is creating some fascinating tools. Their XG technology is a high-performance superset of General MIDI sounds, commands, and effects. Yamaha has just released the S-YXG50C, a software wavetable synthesizer designed to run on MMX processors. Designed for game developers, it offers full XG functionality and, on an MMX, leaves as much as a third of the processor free.

Gamers can scale S-YXG50C's performance, choosing which features to use and when to use them, and like every XG instrument, it provides complete sonic consistently in sounds, effects, polyphony, mix, and other elements.

VLSI

TRY IT ON THE DISC

VLSI (**www.vlsi.com**) has developed the ActiMedia technology to take advantage of DirectSound and PCI. It runs multiple data streams and uses VLSI methods to run interactive positional 3D that works on FM, wavetable, and PCM audio, and a high-quality wavetable synthesis and downloadable sample support. ActiMedia also has its own approach to ISA bus compatibility to give ActiMedia chips full Sound Blaster compatibility.

The first product to use ActiMedia is VLSI's 3D PCI audio accelerator chip, SongBird. The SongBird can be designed onto a PCI computer's motherboard or sound card, and includes three DMA modes for sound-legacy compatibility. The chip also supports a Dolby AC-3 MPEG audio decoder and 5.1-channel surround sound for DVD audio playback, using headphones or two speakers. The ActiMedia hybrid DSP engine supports any combination of up to 32 stereo synthesizer voices or sound effects. Intelligent wavetable caching and ROM-less wavetable architecture opens the door for software-upgradable sound libraries, while the processing bandwidth of the DSP core provides ample computing power to support advanced audio functions.

Quo Vadis Sound Cards

With all these developments, does the dedicated sound card have a future?

Never one to follow, Creative Labs has aggressively introduced two hot new ISA bus cards: the AWE64 and AWE64 Gold (see review on page 85). The Gold card ($249) is a power listener's delight. It comes with 4MB sample RAM and no internal amplifier; a pair of RCA jacks provide stereo line-outs for connection to a real stereo system. The synths on both cards can play FM, hardware wavetable, Creative's new software wavetable, and a new WaveGuide synth—all at the same time. Both cards support Creative's downloadable sound font technology, and both are DirectSound hardware and 3D hardware accelerators. The Gold has a 20-bit S/PDIF digital output with a stellar 120dB signal/noise output (the analog out offers 90dB s/n).

Despite its card orientation, Creative keeps its feet in both the card and single-chip camps. The AWE64 itself uses one chip—"our largest ASIC ever"—though the Gold uses a second chip for its digital output. And the company also offers a one-chip PCI solution to OEMs that offers "wavetable, FM synth, and audio at the quality level of the AWE32." This solution is available on Micron Millennia MMX machines (see review on page 74) and others.

Though they stress that they'll support DirectSound in all new products beginning this summer, Creative is a bit

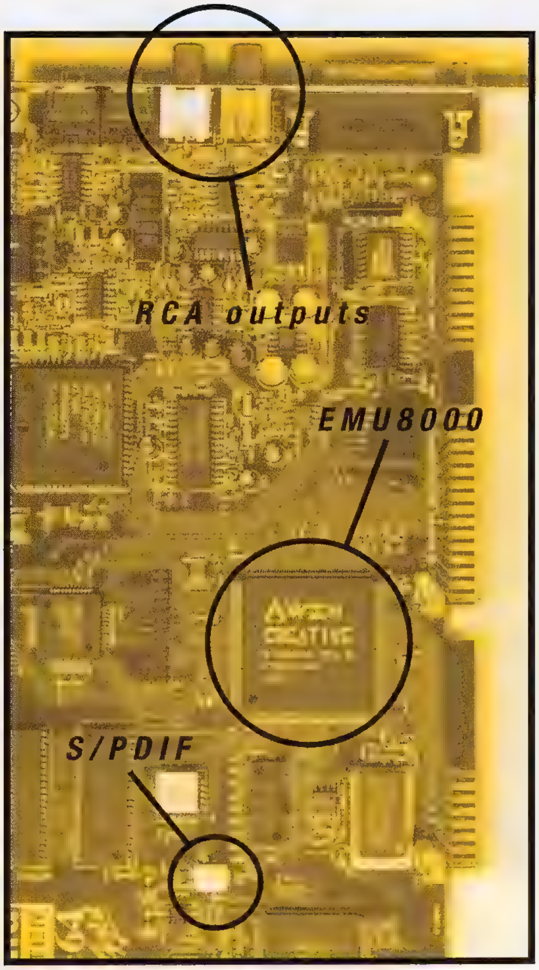
Daisy, Daisy

When 2001's HAL went south, its weird, robotic singing was one of the scariest parts of the movie. The Microsoft Interactive Music Architecture is much cooler, but still makes you wonder.

Created by electronic-music pioneers Todor Fay and Melissa Grey, the IMA is an ingenious device for making desktop and online music better and more bandwidth-friendly. It's a musical engine that lets game or web-site developers specify abstractions such as style, personality, evolution over time, style of band, and more. IMA algorithms then send a constantly changing (or static, if you want), yet small, stream of MIDI data across the bus or over the net, that plays the user's synthesizer. The IMA can respond to any sort of interactivity by creating new music or varying an existing motif.

Ever notice how a lot of game music repeats? Or how the same clip is used for different situations, not fitting either one all that well? Developers are forced to do this because sound takes up so much space and bandwidth. If someone ever actually tried to write music for an interactive application that included individual passages covering every possible interactive possibility, it would require an unfathomable amount of data.

You can hear this amazing device at www.microsoft.com/music/ using the Interactive Music Control on this month's bootDisc that will let you put IMA music on your web page. You only have to open the pod door...



Armed with EMU's EMU8000 synth chip, a 20-bit S/PDIF, and gold-plated RCA connectors, Creative's AWE64 Gold reaches for even greater heights.

curmudgeonly concerning DirectX. They point out that "even many cutting-edge games need to get to functions underneath the current DirectX API set. Functions like reverb, chorus, delay, and 3D positional audio," the Creative rep said. This is "not easily—or at all—done in today's DirectSound. Microsoft promises they'll be there in DirectX5, but in the meantime, the game people can't stop shipping. Our solutions let you do all that by going to same register sets, addresses, and IRQs they've used since Day One."

Ensonic

Like Creative, Ensoniq (**www.ensoniq.com**) still support its excellent ISA cards. Featuring a 90dB signal/noise ratio and 16-bit wavetable MIDI instrument set the VIVO90 is fully DOS- and PnP-compatible, while competing directly with FM boards in price.

Ensoniq plan to use MMX technology to enhance audio performance, but point out that protected-mode DOS games such as *Doom* will not run on MMX alone. The company believes the cost effectiveness of the PCI bus is the real future, though the question of legacy DOS software compatibility is not completely answered.

Ensoniq isn't running from the single-chip future either. The OPUS is built around their next-generation wavetable synthesis technology, providing a single-chip solution that is Sound Blaster-compatible while looking toward the future. The OPUS features 32-voice wavetable synthesis with 32 independent voices, an 18-bit DAC, and an integrated AT bus interface that includes six programmable DMA channels and four programmable interrupts.

Listen Up!

For the first time in a few years, it's beginning to look like PC games and multimedia have the potential to rival the media quality we expect from home-theater TV and movies. The technology is there and costs are falling. Lend me your ears, because it's going to be a lot of fun to hear the changes. ▯

Analog Devices Calls to the Future

Analog Devices' (www.analog.com) Real-time Music Engine is one of the most fascinating efforts to take advantage of new PC technology. Combining Csound, a huge library of music synthesis algorithms developed at MIT, and their own SHARC DSP chip, AD are creating a new model for sound chips.

The Csound algorithms can perform every variety of music synthesis, effect, and signal-processing technique known—and a few new ones. They can act as an: oscillator, filter, mixer, reverberator, harmonizer, phase vocoder, or MIDI message generator, and generate musical tones via every known synthesis technique: additive, subtractive, wavetable, waveguide, waveshaping, FM, LA, granular, and FOF. (Don't ask. It's French.)

To perform these functions, AD has developed the blazingly fast, floating-point SHARC DSP, running 40MIPS; 120MFLOPS; with a 32-bit core; 25 nanosecond single-cycle instruction execution; 1-, 2-, or 4Mbits of dual-ported SRAM; communications link ports; 10 DMA channels; a 240MB/sec transfer rate; and 40Mbit/sec synchronous serial ports. The SHARC can be reprogrammed almost instantly, on the fly, to move from one audio function to the next or to combine a number of functions at once. It's not omnipotent: one SHARC has about the horsepower it takes to act as a 64-voice, 64-part multitimbral synthesizer. But its programmability could also let it run as any combination of types of synths (each with concomitantly less functionality) simultaneously, and multiple SHARCS can be ganged to work together.

Its floating-point processor can even generate complexly processed and mixed sound at very high quality by doing all its operations at high-bit rates internally, and not bringing the audio to 16-bit format until the final output stage. In terms of producing music and audio, this flexibility and potential sonic quality is unique.

While the cost of the newly developed Real-time Music Engine is high, it should eventually severely reduce the price/performance ratio of PC sound technology. Its potential for adding high-quality, low-cost audio to Internet products, consumer web platforms, entertainment-on-demand systems, set-top boxes, and other devices is enormous.

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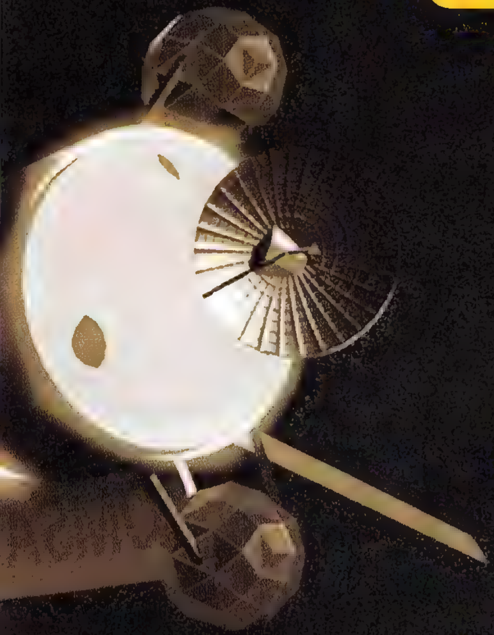

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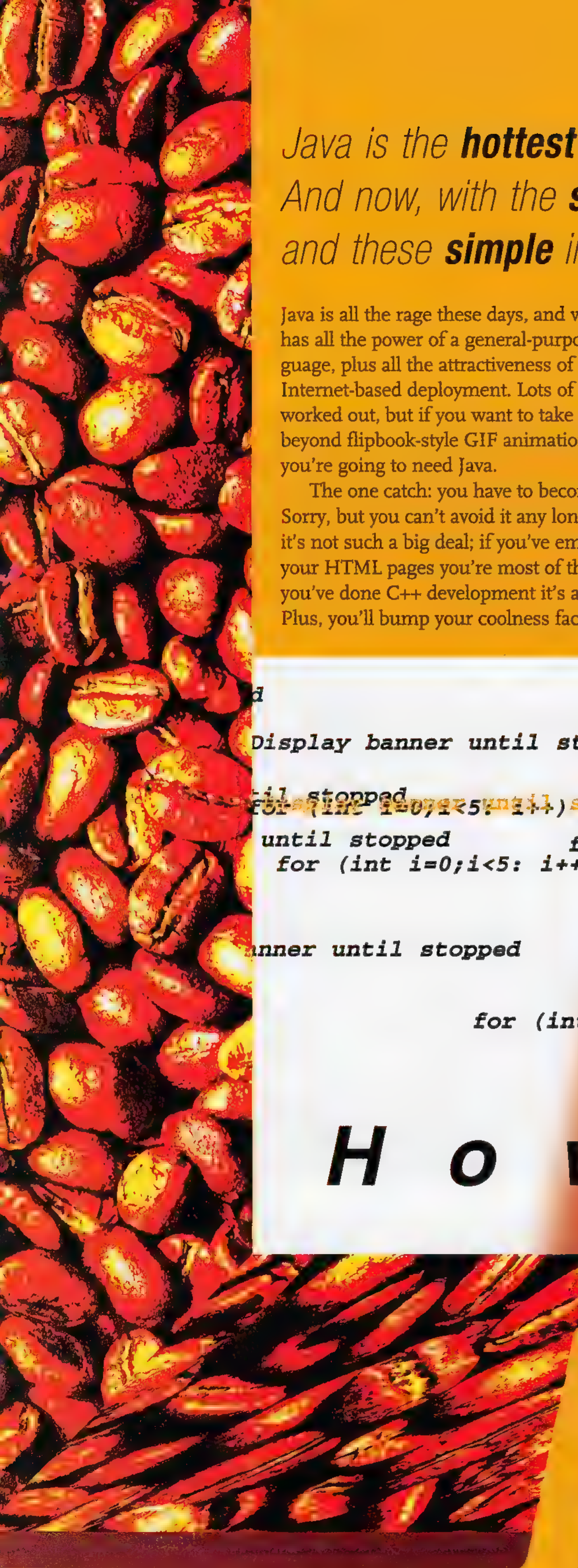


Java is the ***hottest*** *thing to hit* ***web*** *surfers since… well, Java! And now, with the* ***software*** *provided on this month's* ***bootDisc*** *and these* ***simple*** *instructions,* ***you*** *can finally get your feet* ***wet****.*

Java is all the rage these days, and with good reason: it has all the power of a general-purpose programming language, plus all the attractiveness of cross-platform Internet-based deployment. Lots of kinks remain to be worked out, but if you want to take your web content beyond flipbook-style GIF animation and HTML forms, you're going to need Java.

The one catch: you have to become a programmer. Sorry, but you can't avoid it any longer. The good news is it's not such a big deal; if you've embedded JavaScript in your HTML pages you're most of the way there, and if you've done C++ development it's almost a no-brainer. Plus, you'll bump your coolness factor to the next level by knowing Java. Trust us. We've verified this in repeated scientific studies.

Most Java development environments provide visual layout tools, and one or two get quite close to removing the coding chore from the Java developer's plate. But to do anything extraordinary you'll still have to write code. You could work through this article without entering a line of Java (we provide everything on the *bootDisc*), but we encourage you to check out the code in this comfortable setting. You'll thank us later when you're up late brewing the Next Big Java Thing.

The steps we'll take you through will get you oriented, and create an applet you may even e-mail home about.

How to gri java

by neil redding

State of **Java**

Java is an infant. Despite its power, complexity and promise, it's very young, whines a lot, and is temperamental at the most inopportune times. Having said that, it must also be noted that Java promises to be enormously significant, and it's pretty clear that Java will be what it promises to be. It's just a matter of time.

If you've already tried it, you may have noticed that Java WorkShop redraws things way more (or sometimes less) than it should, that you often don't get the right behavior with UI widgets, or that things happen more slowly and consume more system resources than they do in traditional (usually C++-based) applications. Java almost always runs on top of a Virtual Machine (VM), which translates platform-independent Java byte-codes into platform-specific machine instructions at the applet's run-time; this process accounts for most of the slowdown.

Java often doesn't use the same mechanisms (i.e., UI resources and system calls) to present and manage its windows, buttons, scrollbars, and such, and the Java VM isn't integrated into the Windows event-handling system, so things are a bit rough in this area as well. As long as Microsoft delivers on its commitment to Java (see www.microsoft.com/java), these problems should disappear. In the meantime, making kick-ass web content with Java ought to be enough to keep you busy.

```
stack.push (1); // Display banner until stopped
 i++) mystack.push (1); // Display banner until stop
 until stopped
t i=0;i<5: i++) mystack.push (1); // Display banner
 banner until stopped
stopped
for (int i=0;i<5: i++) mysta
```

nd your own

applets

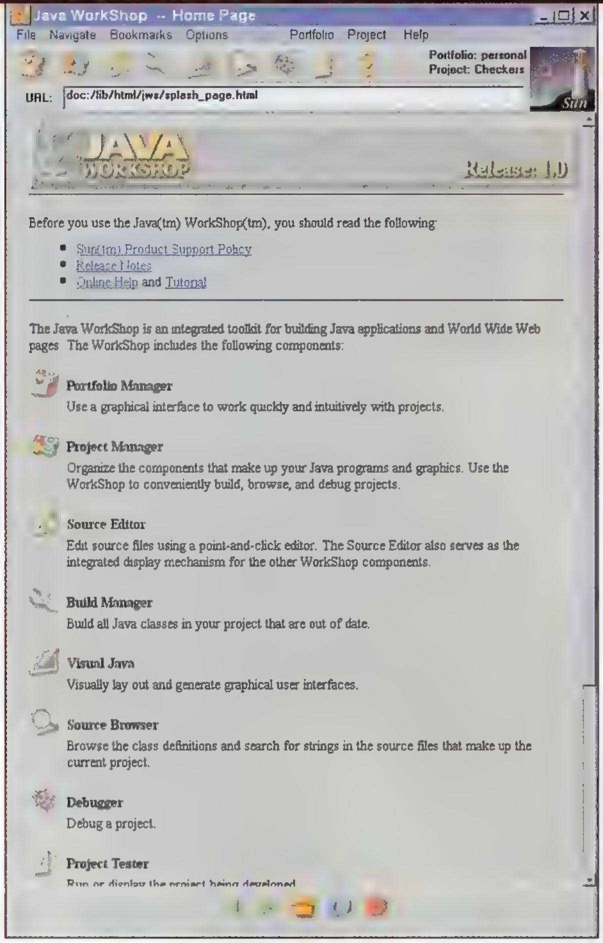
Do it!

This month's bootDisc *contains everything you'll need to follow along with this step-by-step article and create your own Java Applet. The* Java WorkShop *application from Sun Software is in the Demo section. This is a full-featured, save-enabled version, which expires 30 days after installation. Simply click the Launch Demo button. We've also included all the image and sound files. They're in the* GroovyBox *directory on the* bootDisc*, along with a text file containing all the code you'll need (no typing required). So roll up your sleeves and start grinding you own Java!*

Step One

Getting Started With Java WorkShop

This is the main window of *Java Workshop*, called the Home Page. From this window it is easy to get to the various components of the tool.


Java WorkShop -- Home Page
File
Navigate
Bookmarks
Options
Portfolio
Project
Help
Sun
JAVA WORKSHOP
Release: 1.0

Portfolio: personal
Project: Checkers

URL: doc:/lib/html/jws/splash_page.html

Before you use the Java(tm) WorkShop(tm), you should read the following:

- Sun(tm) Product Support Policy
- Release Notes
- Online Help and Tutorial

The Java WorkShop is an integrated toolkit for building Java applications and World Wide Web pages. The WorkShop includes the following components:

Portfolio Manager
Use a graphical interface to work quickly and intuitively with projects.

Project Manager
Organize the components that make up your Java programs and graphics. Use the WorkShop to conveniently build, browse, and debug projects.

Source Editor
Edit source files using a point-and-click editor. The Source Editor also serves as the integrated display mechanism for the other WorkShop components.

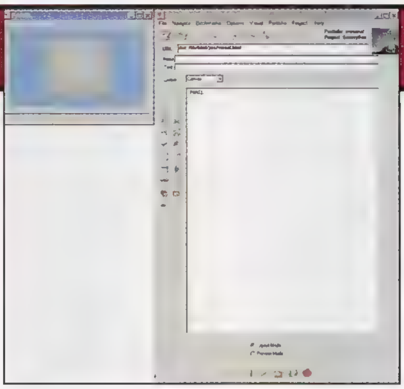
Build Manager
Build all Java classes in your project that are out of date.

Visual Java
Visually lay out and generate graphical user interfaces.

Source Browser
Browse the class definitions and search for strings in the source files that make up the current project.

Debugger
Debug a project.

Project Tester
Run or display the project being developed



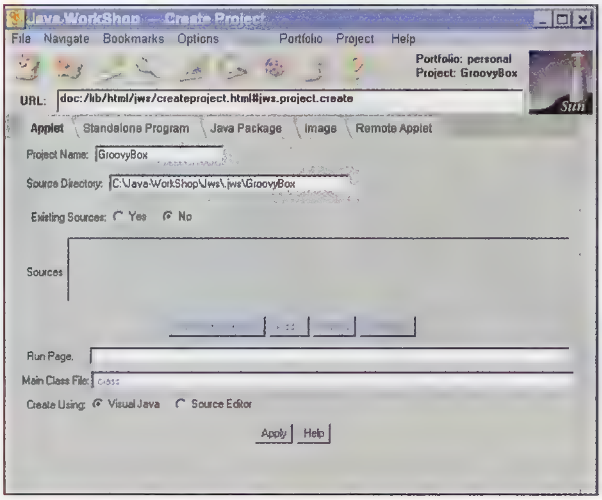
Sun's *Java WorkShop* will be our IDE (Integrated Development Environment). This program was written entirely in Java, demonstrating just how capable Java already is as a programming language.

The environment is very easy to work with and contains all the standard IDE components, including source editor, visual editor, compiler, and debugger, as well as project management features.

When you start up *Java WorkShop*, you'll find it uses a familiar browser-type interface, making the creation and previewing of an HTML-embedded Java applet a natural process. A description of each of the components of the *WorkShop* appears on the Home Page, and a toolbar across the top of the window provides quick access to each of the tool's components.

The first thing you want to do is create a new project for your applet. Select "Create/Applet..." from the Project menu in the menubar; the Applet tab in the Create Project page will be selected, ready for your typing (I didn't say you wouldn't have to type). This project's name is GroovyBox (don't ask why, it might make sense later. Enter the project name in the Project Name field, and append it to the partial path already in the Source Directory field (no problem if your directory doesn't already exist; *Java WorkShop* creates it for you). You can use the defaults for everything else in this tab, so click Apply at the bottom and move on to the visual stuff.

top This is how things look when you first enter Visual Java; the Panel window displays a grid to assist you in laying out your applet's appearance, while the Visual Java page in the main window provides access to a variety of tools for visual construction.
left Creating our GroovyBox project in *Java Workshop*.
bottom Selecting "Create/Applet..." from the Project menu.


Java WorkShop — Create Project
File
Navigate
Bookmarks
Options
Portfolio
Project
Help
Sun
Applet
Standalone Program
Java Package
Image
Remote Applet
Sources
Apply
Help

Portfolio: personal
Project: GroovyBox

URL: doc:/lib/html/jws/createproject.html#jws.project.create

Project Name: GroovyBox

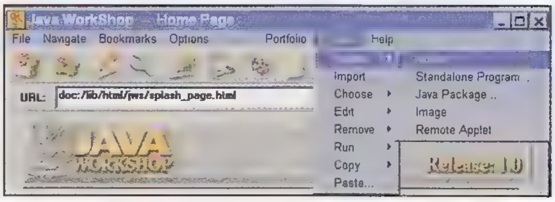
Source Directory: C:\Java-WorkShop\Jws\.jws\GroovyBox

Existing Sources: ○ Yes ● No

Run Page:

Main Class File: class

Create Using: ● Visual Java ○ Source Editor

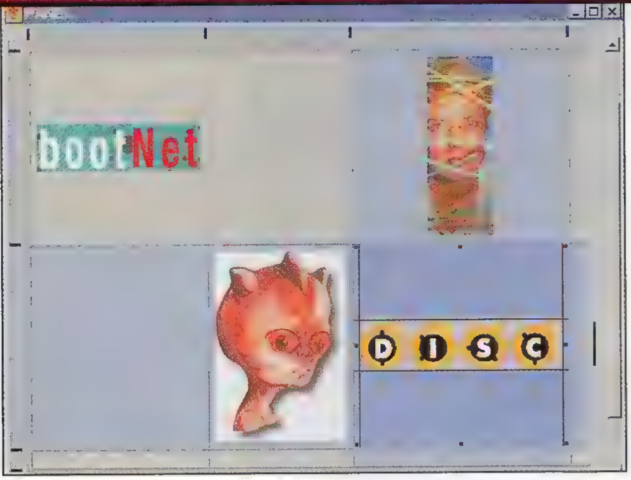

Java WorkShop — Home Page
File
Navigate
Bookmarks
Options
Portfolio
Help
Import
Choose
Edit
Remove
Run
Copy
Paste...
Standalone Program ..
Java Package ..
Image
Remote Applet
JAVA WORKSHOP
Release: 1.0

URL: doc:/lib/html/jws/splash_page.html

Step Two

Using Visual Java to Lay Out Your Applet

The Panel window, populated with groovy images (mid-layout)



Java WorkShop presents an unusual visual layout process: you drop GUI elements into grid slots rather than free-placing them. What you're going to do is insert Image Label widgets into several cells in the grid appearing in the Panel window; you must first select the Image Label button in the palette at the left of the main Visual Java window (Image Label is third from the top in the left column), then Ctrl-click in the cells you want. Go ahead and put Image Labels wherever you want; it won't mess anything up.

Next, specify which image you want displayed in each Image Label. We've provided a variety of image files for you (see the GroovyBox directory), but any of your favorites are just as good. Just make sure they're GIFs. For each Image Label, right-click on it in the Panel window to bring up the Attribute Editor, then fill the "image" field with a file URL that contains the full pathname of the GIF (a bug in *Java WorkShop* prevents the filename alone from sufficing); this amounts to the pathname preceded by "file:///" (note the three slashes).

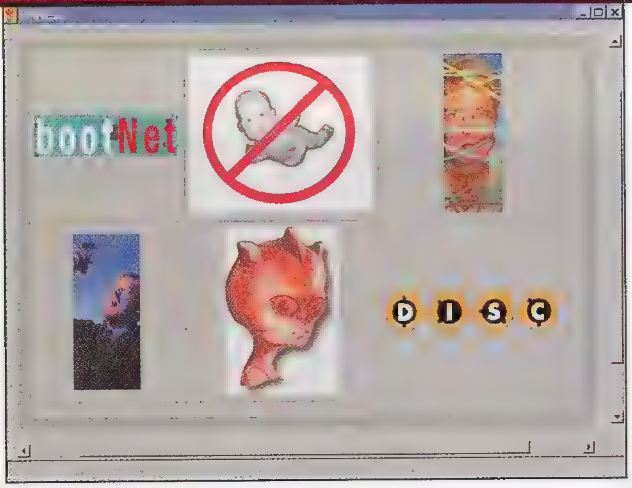
Be sure to enter something memorable in the Name field for each Image Label as well; you'll be using them later on. When you're sure you've got a groovy set of images, click the second icon from the left in Visual Java's toolbar; the "tooltip" at the bottom of the window will read "Save GUI file and generate source files" when you're over the one we're talking about. *Java WorkShop* goes to work generating Java files to support your GUI.

Step Three

The First Fruits of Your Labor

The Wrench(left) is the icon for *Java Workshop*'s integrated Build Manager.

Visual Java's Panel window with the completed GroovyBox layout.



At this point you can build and preview your applet. Select the Build Manager from the toolbar at the top of the *Java WorkShop* window (the icon is a wrench), then click on the single wrench at the left of the Build Manager's toolbar (just below the "URL:" text field). *Java WorkShop* narrates the build as it progresses, and you'll see "Done" at the bottom of the window when it finishes. Click on the Project Tester icon (it's the light switch second from the right in the main toolbar), and you'll see your applet in action.

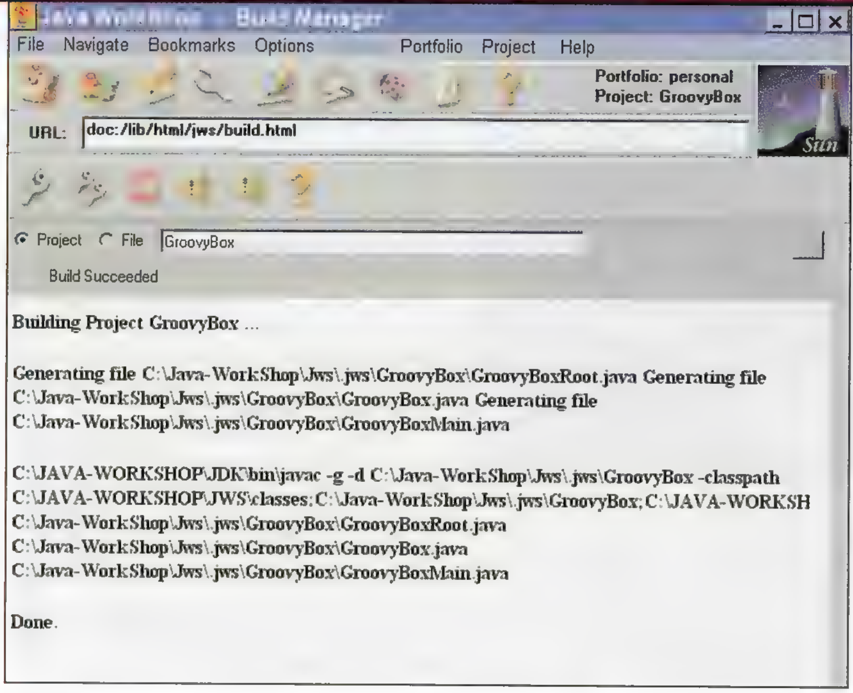
Now it's time to add the groove to our applet.

You're going to add code so that moving the mouse over each image generates a sound. Since Java inherently knows how to play audio clips, there's very little code to write to make this happen; you just need to know where to put it.

Step Four

Looking Under the Hood

Java WorkShop narrates the build for you as it progresses.



```
Build Succeeded

Building Project GroovyBox ...

Generating file C:\Java-WorkShop\Jws\.jws\GroovyBox\GroovyBoxRoot.java Generating file
C:\Java-WorkShop\Jws\.jws\GroovyBox\GroovyBox.java Generating file
C:\Java-WorkShop\Jws\.jws\GroovyBox\GroovyBoxMain.java

C:\JAVA-WORKSHOP\JDK\bin\javac -g -d C:\Java-WorkShop\Jws\.jws\GroovyBox -classpath
C:\JAVA-WORKSHOP\JWS\classes;C:\Java-WorkShop\Jws\.jws\GroovyBox;C:\JAVA-WORKSH
C:\Java-WorkShop\Jws\.jws\GroovyBox\GroovyBoxRoot.java
C:\Java-WorkShop\Jws\.jws\GroovyBox\GroovyBox.java
C:\Java-WorkShop\Jws\.jws\GroovyBox\GroovyBoxMain.java

Done.
```

This is a good time to take a quick break and check out what's in the GroovyBox directory.

You do want to know what's going on under the hood, don't you? Of course you do!

In addition to the .prj and .map files, which *Java WorkShop* uses to track your project's contents and settings, you'll notice three .JAVA files, three .CLASS files, a .GUI file, and an HTML file. You don't remember creating them, because you didn't. *Java WorkShop* generated them automatically, based on values you've entered during the course of this article. Feel free to look at any of these files, but don't modify any of them directly except for GroovyBox.java or you could screw up the automatic file-maintenance system or render the applet utterly unable to run.

GroovyBoxMain.java and GroovyBoxRoot.java take care of setting up your applet. They also initialize Visual Java's Shadows and Groups, special classes of Java objects that manage the visual components of your applet (you can learn more about them in the *WorkShop* documentation). GroovyBox.java is the file to really care about here; it contains the GroovyBox class, which will receive user-generated events and respond exactly as you tell it to.

Java **VRML**

Probably the coolest thing you can do with Java is control 3D VRML worlds. The most popular VRML 2.0 plug-in browsers, Intervista's WorldView 2.0 and SGI's Cosmo Player 1.0, both support what's called the External Authoring Interface, or EAI, which allows Java applets to get and set properties of VRML world components.

You'll first want to go to www.intervista.com or vrml.sgi.com to get your browser if you don't already have one; note that they both require Netscape Navigator 3.0 or greater for the Java EAI to work; IE 3.0 doesn't include the necessary Java support.

Once you're set up for VRML you should check out Black Sun's multi-user worlds for inspiration (www.blacksun.com/vrml/homewrl.htm): they're the state-of-the-art in Java/VRML interaction, as well as pushing the evolution of Internet-based cyberspace on the PC. Plenty of other amazing VRML content awaits you as well; see vrml.sgi.com/worlds/ for starters.

The point is, you can change the contents, appearance, and behavior of your VRML world—pretty much anything—from a Java applet. Discovering the state of a VRML object is just as easy, and once your applet's got this information it can do anything Java can

5

Step Five

Adding the Groove

Type this code into your applet... or just paste it in from the text file on the bootDisc.

```
public boolean mouseEnter(Message msg, Event evt, int x, int y)
{
Applet ourApplet = getApplet();
       AudioClip clip;
       String clipFilename = null;

       // If the mouse is entering any of our Image Labels, we play
       // a sound that has nothing to do with the image.
       // Confusion is Entertainment!
       if (msg.target == gui.alien)
                 clipFilename = "mix.au";
       else if (msg.target == gui.thatgirl)
                 clipFilename = "gEEk.au";
       else if (msg.target == gui.disc)
                 clipFilename = "powerchord.au";
       else if (msg.target == gui.mrbrad)
                 clipFilename = "hahaha.au";
       else if (msg.target == gui.baby)
                 clipFilename = "picking.au";
       else if (msg.target == gui.bootnet)
                 clipFilename = "whatEVer.au";

       if (clipFilename != null)
       {
                 clip = ourApplet.getAudioClip(ourApplet.getDocumentBase(), clipFilename);
                 clip.play();
       }
```

Bring up the Source Editor by clicking on the pencil-on-paper icon in the *Java WorkShop* toolbar; if GroovyBox.Java doesn't appear in the window, use the Open command in the File menu. GroovyBox.java contains extensive comments explaining what it's doing at each point; if you're familiar with C++ or other object-oriented languages you should be able to make some sense of it. If not, don't worry; we're about to give you the code you need to enter to get the groove happening.

Scroll to the bottom of the file; you'll see the handleEvent() method, which does nothing but call its superclass's handleEvent() method. You're going to add a method called mouseEnter(), which will, strangely enough, be called when the mouse enters an area occupied by one of your Image Labels. The code is above. Make sure that you enter the entire method's code immediately before the final '}' in the file.

You probably guessed that this code isn't customized to display your chosen GIFs and play the selected audi. In fact, it's right out of the sample GroovyBox applet that comes on the CD. In other words, now's the time for you to edit this code so that it does the right thing with your images and audio clips.

The name that follows each gui. on the right side of the '==' in each *if statement*, and the names of the .au files. Remember the Image Label names we said you'd use later? Those are what go after the "gui." in the *if statements*; you'll want one *if statement* for each of your Image Labels, so if you don't have six of them like the sample you'll need to add or remove pairs of lines of code until you've got the right number.

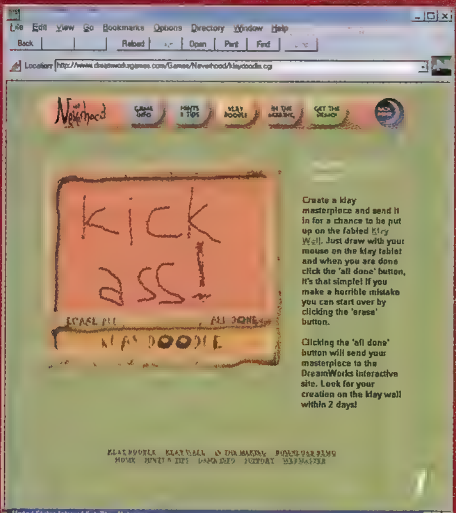
Make sense? In case it isn't clear, what your mouseEnter() method does is compare the "mouse target" (i.e., the thing the mouse is pointing at) to each Image Label (referred to by "gui.yourImageLabelName"); if they're equal, then we set the clipFilename to the name of the .au file we want to play when the mouse is over that Image Label. Once we know which Image Label the mouse is over (if any), we can load and play the desired audio clip via the code below the if's. Note that you must leave the final "return" statement in this method alone; if you remove it, other things will break.

At this point you can probably tell what GroovyBox is gonna do when you build it, so make it happen! Build your project in the usual way, then click that light-switch Project Tester button. Try closing your eyes and driving the mouse haphazardly for maximum weird effect; the more random and unrelated your images and sounds are, the more ridiculous and fun this thing'll be.

do; display a textual description in an applet window, hand it off to a CGI script for generating on-the-fly HTML, send it to a multi-user server (like the Black Sun stuff)—anything you can think of. The power of Java integrated with VRML and other browser technologies is truly phenomenal.

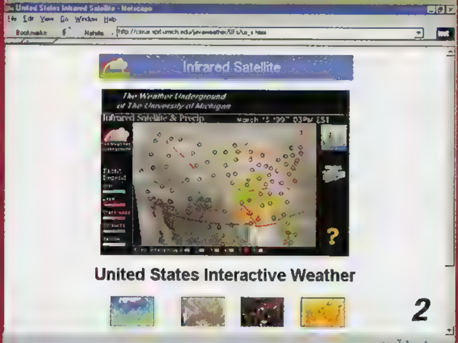
Ready to get started?

Check out vrml.sgi.com/developer/java.html *for a collection of how-to instructions and specifications; if you want introductory stuff on VRML technology just back out a level to* vrml.sgi.com/developer.


File Edit View Go Bookmarks Options Directory Window Help
Back
Reload
Open
Print
Find
Location: http://www.dreamworksgames.com/Games/Neverhood/klaydoodle.cgi
Neverhood
GAME INFO
HINTS & TIPS
KLAY DOODLE
IN THE MAKING
GET THE DEMO
kick ass!
ERASE ALL
ALL DONE
KLAY DOODLE
KLAY DOODLE KLAY WALL IN THE MAKING DOWNLOAD DEMO
HOME HINTS & TIPS GAME INFO SUPPORT WEBMASTER

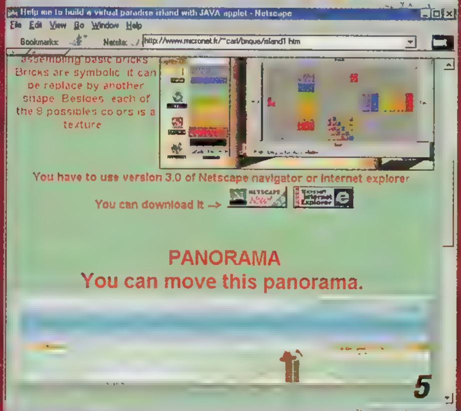
Create a klay masterpiece and send it in for a chance to be put up on the fabled Klay Wall. Just draw with your mouse on the klay tablet and when you are done click the 'all done' button, it's that simple! If you make a horrible mistake you can start over by clicking the 'erase' button.

Clicking the 'all done' button will send your masterpiece to the DreamWorks interactive site. Look for your creation on the klay wall within 2 days!


United States Infrared Satellite - Netscape
File Edit View Go Window Help
Bookmarks
Netsite: http://cirrus.sprl.umich.edu/javaweather/IFS/us_s.htm
Infrared Satellite
The Weather Underground of The University of Michigan
Infrared Satellite & Precip

United States Interactive Weather

2


Help me to build a virtual paradise island with JAVA applet - Netscape
File Edit View Go Window Help
Bookmarks
Netsite: http://www.micronet.fr/~carl/bnque/island1.htm

assembling basic bricks
Bricks are symbolic it can be replace by another shape. Besides each of the 8 possibles colors is a texture

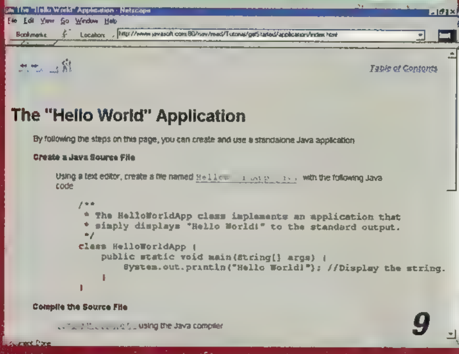
You have to use version 3.0 of Netscape navigator or internet explorer

You can download it -->

PANORAMA

You can move this panorama.

5


The "Hello World" Application - Netscape
File Edit View Go Window Help
Bookmarks
Location: http://www.javasoft.com:80/nav/read/Tutorial/getStarted/application/index.html
Table of Contents
Document: Done

The "Hello World" Application

By following the steps on this page, you can create and use a standalone Java application

Create a Java Source File

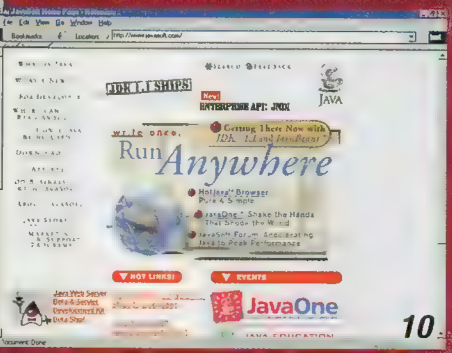
Using a text editor, create a file named HelloWorldApp.java with the following Java code

```
/**
 * The HelloWorldApp class implements an application that
 * simply displays "Hello World!" to the standard output.
 */
class HelloWorldApp {
    public static void main(String[] args) {
        System.out.println("Hello World!"); //Display the string.
    }
}
```

Compile the Source File

using the Java compiler

9


JavaSoft Home Page - Netscape
File Edit View Go Window Help
Bookmarks
Location: http://www.javasoft.com/
Search Feedback
JDK 1.1 SHIPS
New!
ENTERPRISE API: JNDI
JAVA
Write once, Run Anywhere
Getting There Now with JDK 1.1 and JavaBeans
HotJava Browser Pure & Simple
JavaOne Shake the Hands That Shook the World
JavaSoft Forum Accelerating Java to Peak Performance
HOT LINKS!
EVENTS
JavaOne
JAVA EDUCATION
Document: Done

10

Java **Sites**

There's so much awesome Java stuff out there it's hard to know where to start, but we'll point you to a few of our favorites, as well as links to sites that list everything under the sun.

For applets, you'll want to check these out:

1 ***KlayDoodle*** *– If you've seen The Neverhood you'll find this one reminiscent of it. Drawing on clay is way fun! (www.dreamworksgames.com/Games/Neverhood/klaydoodle.cgi).*

2 ***Java Weather*** *– a variety of atmospheric data-mapping happening here (cirrus.sprl.umich.edu/javaweather/).*

3 *Everyone's favorite: the* ***Java Etch-a-Sketch****! Relive your childhood with either of two variants of this timeless toy; the second one has sound! (www.codepilot.com/~kbenell/netsketch/netsketch.html and www.neteaze.com/java/hitch.html).*

4 ***Multi-user VRML worlds*** *– these really rock! See the Java/VRML sidebar for details.*

5 ***www.gamelan.com*** *– this site has more great stuff than we could possibly list.*

6 ***Netscape's site links to more excellent applets*** *– see home.netscape.com/comprod/products/navigator/version_2.0/java_applets/index.html.*

7 ***Yahoo*** *as well – www.yahoo.com/Computers_and_Internet/Programming_Languages/Java/.*

8 ***JavaWorld magazine*** *– a great clearinghouse for everything Java (www.javaworld.com/javaworld/common/jw-jumps.html).*

For developer-related stuff, look into these:

9 *The official source from the folks who started it all:* ***Sun's JavaSoft site*** *(www.javasoft.com/).*

10 ***Sun's Java Language Tutorial*** *– what better way to get started? (www.javasoft.com/tutorial/index.html).*

11 ***Intel Media for Java*** *– this technology allows you to develop multimedia-rich Java applets using Intel playback technology. Ready for 3D spatialized audio? Check it: developer.intel.com/ial/jmedia/.*

12 *Monthly* ***Java Newsletter*** *covering all sorts of stuff of interest to the Java whiz (rainbow.rmi.net/~gleam/index.html).*

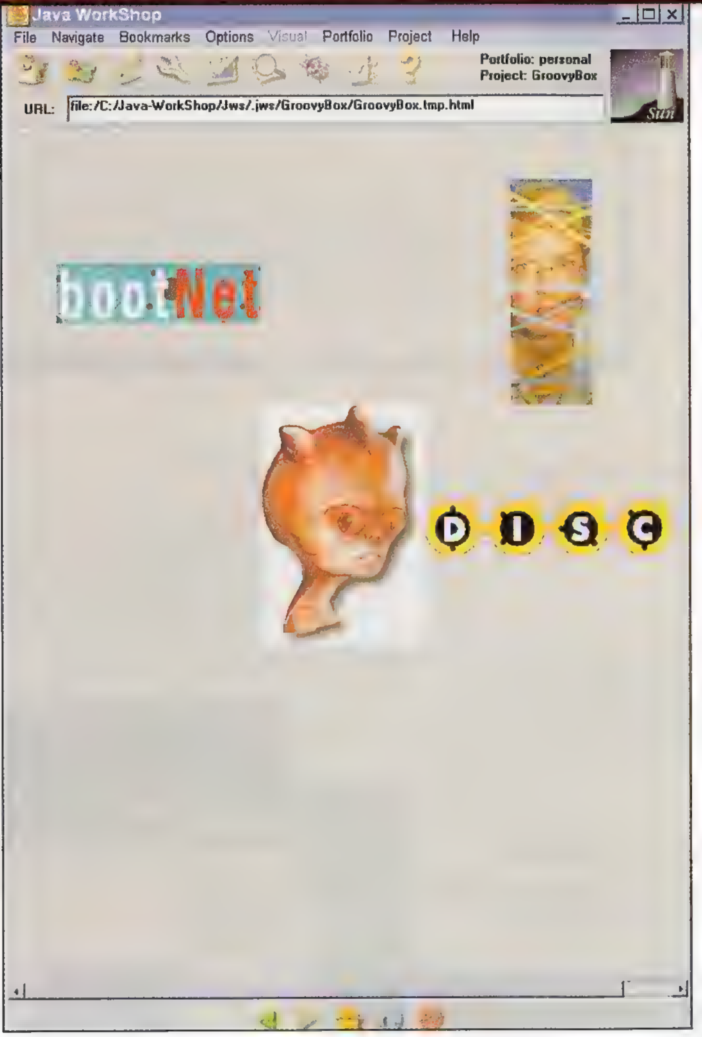
These should get you off to a running start. As with all things Internet, keeping your eyes peeled for more interesting links is the way to go.

Step Six

Now What?

6

The fabulous GroovyBox applet running under *Java Workshop.* You can almost hear it, can't ya?



Portfolio: personal
Project: GroovyBox

URL: file:/C:/Java-WorkShop/Jws/.jws/GroovyBox/GroovyBox.tmp.html

This is just the beginning: first GroovyBox, next World Domination. Or at least World Wide Web publishing, which you can learn about in the "Tutorial Six: Publishing a Project" section of the *Java WorkShop* tutorial. Describing how to make an applet available on the web could easily fill an entire article, so we won't go into the process here.

Of course, Java can do a lot more than display GIFs and play audio clips. If you're jonesing for more, you might want to go through the complete tutorial included with *Java WorkShop.* When you're done with that, you'll be ready to check out the Java developer sites; see the sidebar for listings.

The Power is Yours!

You should ***feel*** *much* ***cooler*** *now. You've got that* ***Java thing happening****. No doubt about it. You'll* ***soon*** *find it sliding off your fingertips into more* ***excellent applet code****. What more could you ask from* ***an hour*** *or so?*

the boot 12-step program

DEALING WITH YOUR
PC **OBSESSION**
DAY TO DAY
BY BREAKING IT DOWN
INTO 12 **EASY** STEPS

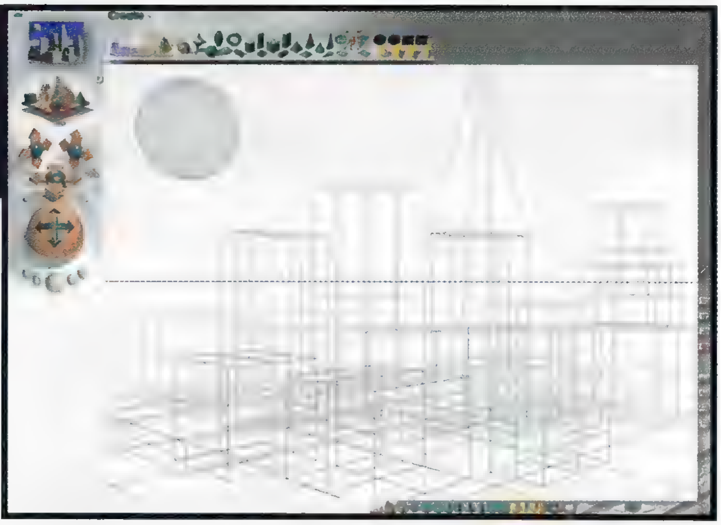
this month:

Create Breathtaking Animated Fly-Throughs In Bryce2

Bryce2 is great for creating 3D worlds. Unfortunately, once you've created that amazing realm you're restricted to just squashing it flat in a static 2D-render, like a butterfly pinned under a collector's glass. While future versions of the application promise to break into the next dimension, the technique outlined here will allow you to create movies of dynamic flights through your *Bryce2* canyons and into the briny blue of your *Bryce2* lakes. All you need is the program (or the demo version on this month's *bootDisc*) and a video-editing program such as Adobe's *Premiere*. A massive amount of free hard-disk space wouldn't hurt either, given that you'll be rendering hundreds of frames of animation.

— *Brad Dosland*

① Open (or create) the .BRC model in *Bryce2* that you want to fly (or drive) through.



1 Get Your Bearings

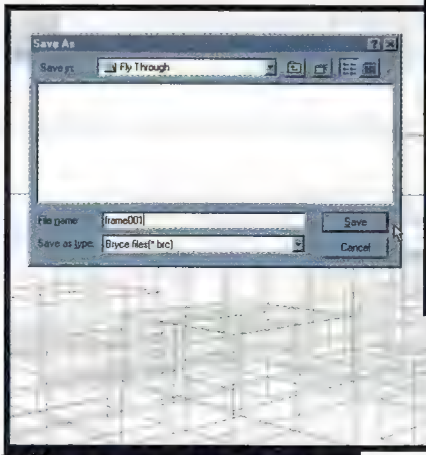
Open the scene you want to navigate in *Bryce2*.

2 Taxi For Liftoff

Move the camera to the point in your scene where you want the movie to begin and aim it at what you want in the initial frame.

3 Log Your Flightplan

Save your starting position model as "frame001" by going to the Save As command in the File menu.



Save As

Save in: Fly Through

File name: frame001

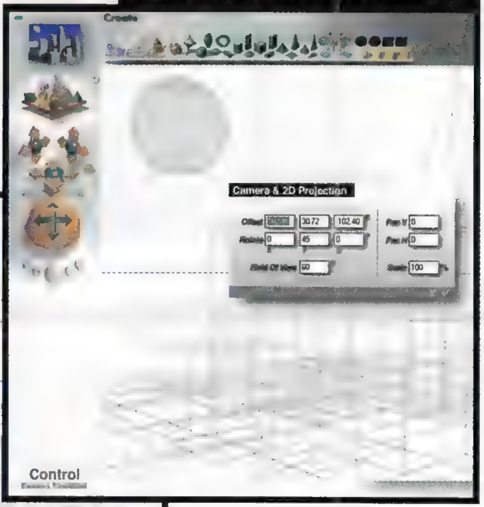
Save as type: Bryce files(*.brc)

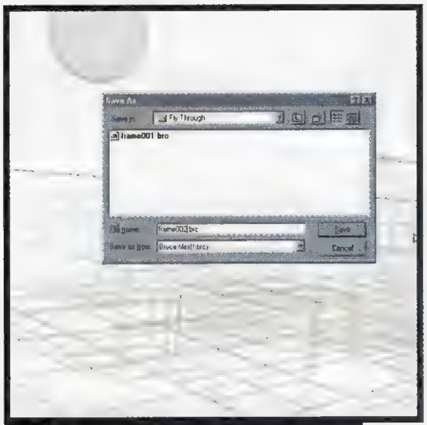
③ Save your scenes with sequential numbers in the name to help keep them in order when compiling your movie.

4 Chart a Course

Double-click on the Camera Trackball control on the left side of the screen to bring up the controls. Now, try plugging sequential numbers into the X, Y, and Z coordinates in small increments (between 1 and 10) to get an idea of the impact they have on your flight path. Combining movement along each axis will allow you to plot any path through your world.

Double-clicking on the Camera Trackball (the peach-colored ball with the green arrows) brings up this camera controller. ④




Save As
Save in: Fly Through
frame001.bro
File name: frame002.brc
Save as type: Bryce Mesh (.brc)
Save
Cancel

⑤ Subsequent frames should be saved (not rendered) with sequential numbers in the file name.

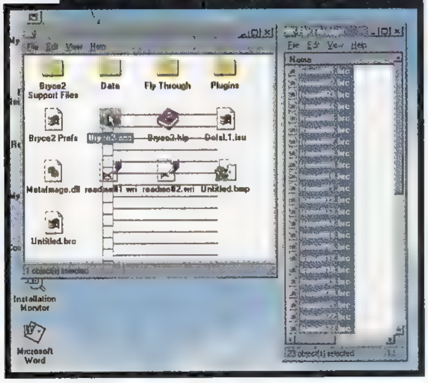
5 We Have Ignition

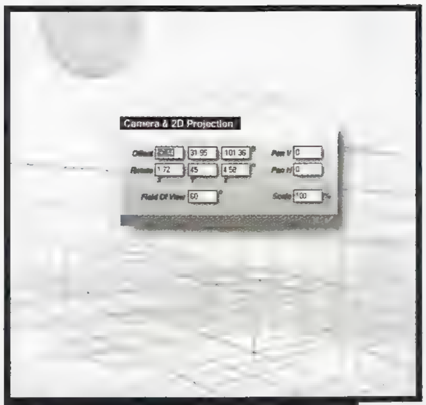
Once you've decided on a path, enter the coordinates for the second frame in the Camera Trackball controls and save this model as "frame002."

6 Calculate Fuel Needs

Repeat this process for each frame. *Bryce2* doesn't have any of the handy path-based animation tools found in professional tools, so you'll need the patience of a claymation animator to guide your first-person flight. Remember, you'll want a minimum of 15fps for passable-quality animation. Do the math and you'll see that even a 30-second movie will require 450 rendered frames. That's why you needed all the free hard-disk space.

⑧ Take advantage of *Bryce2*'s only good animation tool… batch processing!


File Edit View Help
Bryce2 Support Files
Data
Fly Through
Plugins
Bryce2 Prefs
Bryce2.hlp
Deisl.1.isu
MetaImage.dll
readme.wri
readme2.wri
Untitled.bmp
Untitled.brc
1 object(s) selected
Installation Monitor
Microsoft Word
Name
23 object(s) selected

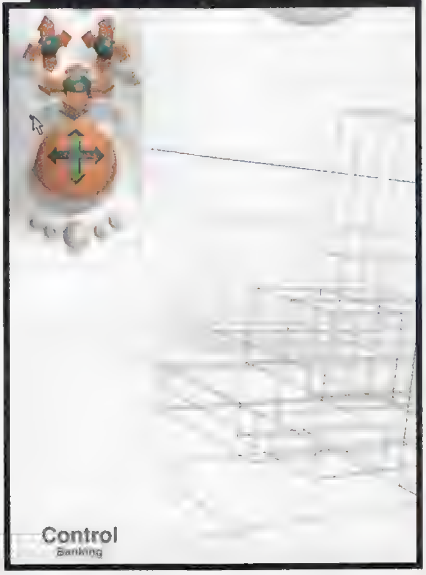

Camera & 2D Projection
Offset
Rotate
Field Of View
Pan V
Pan H
Scale

⑦ Fancy aerial manuevers can be performed via X-Y-Z Rotations, or…

7 Performing Aerobatics

Once you get over the jetlag of rendering your movie frame by frame, experiment with aerobatic manuevers such as barrel rolls and banked turns. With enough practice you'll be performing Immelmanns in no time.

⑦ …You can grab the joystick and try executing manually with the Trackball.


Control
Banking

8 Engage Autopilot

Once you've created and saved all your frames for your movie, leave *Bryce2* and go into the Explorer. Go to the folder you saved all the files into, shift-select them all and drag them into *Bryce2*. Even if you have a MiG-31 of a PC, this is a long flight. Go eat a frozen dinner, watch an in-flight movie, have a few drinks from those tiny bottles of booze, accost the flight attendant, and pass out in your chair for a good night's rest.

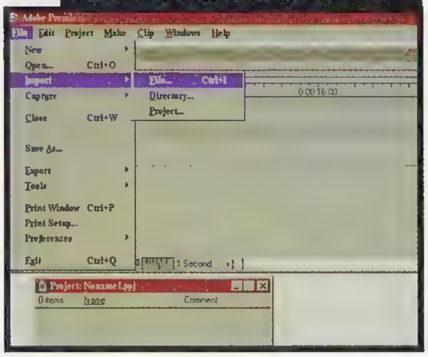
9 Dawn Patrol

When you wake up, you should find a folder filled with rendered frames (unless the program hung, or you ran out of disk space, or the power went out during the night…).

10 Holding Pattern

Launch your video-editing program and import the rendered frames. Depending on the software you're using, you'll probably need to manually assemble the frames into the correct order in the Project window.

⑩ Import your rendered scenes into a video-editing program and get to it.


Adobe Premiere
File Edit Project Make Clip Windows Help
New
Open… Ctrl+O
Import
Capture
Close Ctrl+W
Save As…
Export
Tools
Print Window Ctrl+P
Print Setup…
Preferences
Exit Ctrl+Q
File… Ctrl+I
Directory…
Project…
1 Second
Project: Noname1.ppj
0 items
Name
Comment

11 Lower Your Gear

Add any dissolves and effects you may want to add. If your video-editing program supports plug-ins, any number of amazing post-processing effects are possible at this stage.

⑫ Hand me that bag… I think I'm gonna be sick.

12 Land That Puppy

Preview your animation and compile your movie into whatever format suits your compression/quality needs. Given the amount of blood, sweat, and tears you put into this, you should seriously consider a lossless algorithm that doesn't scale the image down at all.

After all, you just flew in from *Bryce2* and boy… are your arms tired.

boot clinic

Flick your BIC

Thanks for the great how-to about installing motherboards in *boot* 07. I wish I had such information when I built my first computer.

If we'd known about the BIC pen method, we'd have plucked our eyebrows with these tweezers instead.

As for removing the plastic standoff, the best tool I've found is to the remove the guts from a medium, blue BIC ball point pen. The outside shell at the tapered end is the perfect size to slip over the standoffs, compressing them for easy removal. It's also safer than using needlenose pliers, which could slip and damage the old motherboard, making it useless to sell at a swap meet to recover a few bucks.

David Price

> "I own a home-built P200 with a Matrox Mystique 3D, but my Qbench scores are pathetic."

FATfree OS

None of the big PC companies are selling their computer with FAT32, and will void the warranty if it's installed. What exactly are FAT32, FAT16, OSR/1, and OSR/2? What are they good for and where can I get them?

Itay Rand

Technical Editor Chris Dunphy replies: *FAT32 is a modern incarnation of the venerable FAT16 file system that has been around since the dawn of DOS. FAT32 allows for partitions larger than two gigabytes (all the way up to two terabytes), and makes more efficient use of space on your hard drive. System vendors are wary of using FAT32 as yet, because they fear compatibility problems. If some hapless user tries to use a file system utility that expects FAT16 on a FAT32-formatted drive, it's conceivable that the whole drive could be wiped.*

OSR stands for OEM Service Release and is the version of Windows sold by Microsoft to system makers for inclusion with a new PC. OSR/2 is the latest release of Windows, and the only way you can legally get it is by buying a machine manufactured in 1997. (Though, oddly, some new PCs are still shipping with OSR/1.)

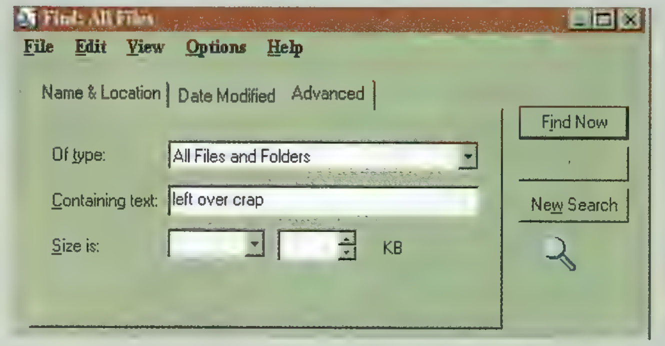
New features in OSR/2 include: FAT32, support for bus mastering drives (which gives a huge performance boost), better power management support, a new (and seemingly buggy) device-installation wizard, the ability to change resolution and color depth without rebooting, a tool for changing your screen refresh rate, and MMX support in the OS.

To get your hands on most of these features without buying a new system, you'll have to wait for Memphis (Windows 98?) to be released, though a few of the more cosmetic improvements can be downloaded from **www.microsoft.com***.*

The virus was easier to remove

I installed *VirusSafe 95* on my hard drive and when I restarted my PC there was an error in finding the program, so I uninstalled the damn thing. But it didn't delete all the files that came with the program so I deleted them manually and restarted my machine. Well, it said the same damn thing. I think it installed a line in my CONFIG.SYS or AUTOEXEC.BAT or something. Any ideas what this could be?

Web master Daevid Vincent replies: *First run the Find Files program from your taskbar. Using the advanced search, you can look for files containing a specific phrase. Check the big four files: CONFIG.SYS, AUTOEXEC.BAT, WIN.INI, and SYSTEM.INI for the name of the file that can't be found. A word of caution: No matter how tempting, don't mess with the Registry! Barring these two ideas, we suggest that you contact McAfee and ask them for help.*



Of type: All Files and Folders
Containing text: left over crap
Size is:

Running the Find Files program in your taskbar is a handy way to clean excess crud from your system files.

Scandisk doesn't defrag

In *boot* 06, page 51, the system shape-up feature incorrectly identifies Scandisk as a defragging utility for DOS. Since about DOS 5 or so, a defrag utility has been available.

Scandisk scans for disk errors and is supposed to be a better version of the older chkdsk, which is still included. It checks for disk errors, bad fat entries, etc., but does not defrag. However, you should still scandisk before defragging.

John Windberg

Quake with a limp

I own a home-built P200 with 32MB, a Matrox Mystique 3D card with 4MB, but my Qbench scores are pathetic: 45fps for 320x200 and 12fps for 640x480. Other similarly configured machines get much higher scores. What is most important for speed? CPU? RAM? Cache? Chipset? Is the Pentium Pro better for *Quake*? Is the game 32-bit or 16-bit? I plan to buy a new motherboard with the HX chipset and the Diamond Monster 3D, and daisy chain it to my Matrox Mystique. Any other suggestions?

James D. Gardner

Hardware Editor Andrew Sanchez replies: *High frame rates are a result of a number of factors and* Quake *has a knack for pushing some serious floating-point operations. As a rule: the faster the CPU, the better. With unaccelerated* Quake, *all the polygon rendering is done by the CPU, so offloading that task to a dedicated 3D accelerator works wonders.*

A Pentium Pro will be better for Quake *due to its faster pipeline and its ability to number crunch a helluva lot better than a Pentium.*

Quake *uses Rational's DOS4GW DOS extender, which puts DOS in a 32-bit protected mode environment, so, yes...* Quake *is a 32-bit application.*

You may want to look into the newer 430TX PCIset, which supports Ultra 33/DMA transfer, 256MB of RAM, SIMM or DIMM RAM, and a host of other cool features. If maximum RAM is a priority, then you wanna stay with the HX, which supports up to 512MB. Otherwise, you sound good to go.

Notebook 3D

I own three desktop systems but my notebook is my favorite because I can take it to a friend's house, plug into their network, and have a hell of a time.

The one major limitation is the lack of any 3D acceleration. It's frustrating to boot up your favorite network game and see your friend's computer running an awesome 3D-accelerated version. Are there any PCMCIA 3D-accelerator cards in the works? Is it possible to fit supporting chipsets and memory into such a small package?

Brian Dinse

Technical Editor Chris Dunphy replies: *We know of no PCMCIA-based 3D accelerators, and doubt that they would be technically feasible. (But we are eager to be proven wrong!)*

However, ATI has a version of their Rage II chip designed to drive an LCD screen that they were showing at fall Comdex. No notebooks with this chip have been announced, but we hope to see the first 3D-accelerated notebook systems soon.

Golem, good

In response to the "Golem in the gears" letter in *boot* 09, the Cyrix 6x86 does not support the Pentium instruction set and has lower floating-point performance than the Intel Pentium. The AMD K5 does support the entire documented Pentium instruction set, but again has poor FP performance. I think this is what you were getting at: They are good chips in their own right but aren't exact clones.

Jeremy Wadsack

Danger Will Robinson! Danger!

I was reading about a major problem in the *boot* 07 Clinic where someone was using tune-up grease instead of heat-sink compound for CPU cooling.

I'm not familiar with the thermal properties of tune-up grease but if it's heat resistant, as mentioned in the letter, that reader could be doing more harm than good to his system.

Heat-sink compound's designed to be extremely heat-conductive allowing the transfer of heat from the CPU casing to the heat sink on the CPU fan. Insulating the CPU puts it in greater danger of burning out than doing nothing at all.

The letter also stated that the CPU seems to be cooler now. If this was tested by touching the CPU insulated with tune-up grease, it *would* feel cooler because the heat is being contained within the CPU rather than being dispersed to the case.

Glynn Bushart

Much, much cooler

I would like to purchase the Peltier Cooler described in *boot* 05. But there isn't any information about where to buy it. Can you help?

Dennis

Software Editor Sean Downey replies: *The Peltier CPU Cooler mentioned in the overclocking 12-Step can be purchased at ComputerNerd USA (www.computernerd.com).*

Wasn't Triton Neptune's father?

The *boot Worthy* motherboard roundup in *boot* 08 had directions to find out what board you had. There were numbers that translated to the 430VX, 430HX, and 430FX series in the system properties. But when I followed the directions, I found I have an "Intel Neptune Pentium Processor to PCI Bridge." What's a Neptune PCIset and how does it compare to a Triton or Triton II?

Onslaught

Hardware Editor Andrew Sanchez replies: *Neptune is one of Intel's earlier PCIsets, from the days when they were really sea-god crazy (before the nomenclature switched to 430FX, 430VX, etc.).*

Compared to the newer chipsets offering USB support and bus-mastered PCI slots, the Neptune comes up looking pretty dusty. Unfortunately, PCIsets are not upgradable—to get with the times, you'll have to slap in a new motherboard.

Do NOT remove this tag under penalty of law

Is it safe to upgrade my BIOS on my Creative Labs 3D Blaster? The manual says it voids the warranty, but the 30-day warranty is over now. Isn't a 30-day warranty pathetic? I have a five-year warranty with my Monster 3D. If upgrading the card's BIOS won't damage it and will improve the performance, then I'm all for it. Also, how do I turn on extra features such as water transparency?

Erik Coulter

Technical Editor Chris Dunphy replies: *I agree that a 30-day warranty is pathetic, but you must admit a five-year warranty on a piece of computer equipment that'll be obsolete in a year is overkill.*

If you upgrade your Creative 3D Blaster with a BIOS patch provided by Creative, they won't give you any gruff, regardless of what the manual says. I think they're more concerned about you trying to use a BIOS upgrade that's designed for a Sierra or Canopus Vérité card than futzing up the 3D Blaster. So go ahead and upgrade, just make sure you get the upgrade direct from Creative's web page and follow the instructions EXACTLY.

GLQuake supports water transparency, reflections, and lots of other effects. It runs on any OpenGL-compatible graphics card, but is currently optimized for the 3Dfx chip, which translates into jaw-dropping performance on your Monster 3D. Just find GLQuake on the net and check the included readme file for how to turn on all the features.

ATI's new version of their Rage II chip is designed to drive your LCD screen.

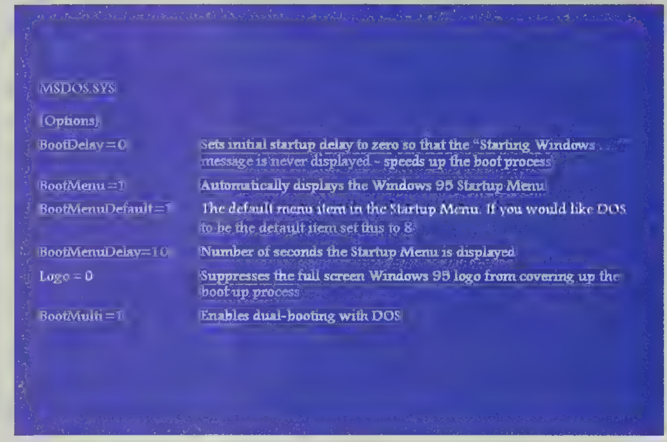
Cache poor

I'm upgrading my Pentium 120 and am curious about cache memory. I just upgraded to 32MB of RAM and want to upgrade to 512K of cache. According to my motherboard manual, I need eight pieces of 64kx8, 15ns SRAM in either 3.3v or mix voltage. Seems simple, except no one carries this type of memory. Is this type of upgrade worth it? And, if so, where can I get it?

Djweave

Technical Editor Chris Dunphy replies: *Well, if you have no cache at all, do whatever you can to get some and you'll notice a huge improvement. But if you have 256K of cache, doubling it to 512K may not prove to be worth the hassle. To track down the chips that you need, try calling a major chip dealer (not a local dad and grandpa shop) with your motherboard manual in hand. I personally turn to the Chip Merchant (800.426.6375; www.thechipmerchant.com) when I need some hard-to-find memory.*

Well, if you have no cache at all, do whatever you can to get some and you'll notice a huge improvement.



```
MSDOS.SYS

[Options]
BootDelay=0           Sets initial startup delay to zero so that the "Starting Windows ..."
                      message is never displayed - speeds up the boot process
BootMenu=1            Automatically displays the Windows 95 Startup Menu
BootMenuDefault=1     The default menu item in the Startup Menu. If you would like DOS
                      to be the default item set thus to 8
BootMenuDelay=10      Number of seconds the Startup Menu is displayed
Logo=0                Suppresses the full screen Windows 95 logo from covering up the
                      boot up process
BootMulti=1           Enables dual-booting with DOS
```

DOS 7.0 is Win95 with two-thirds less GUI. You need DOS 6.22 to dual boot with Win95.

Dual-boot boogie redux

I know it worked when *you* did it, but I just can't get my PC to dual boot. You used DOS 6.22 and I'm running 7. Is that why my MSDOS.SYS file doesn't contain any of those really neat things like BootDelay and BootMenu? I'm only as far along as trying to restart my computer to see if the previous version of MS-DOS will run. When I try to boot it up, it says that it's not supported and reboots Win95.

Dustin Zachary

Software Editor Sean Downey replies: *You need to have DOS 6.22 installed before setting up a dual boot between it and Win95.*

When Win95 is first installed not all the possible parameters are listed in the MSDOS.SYS file. For example, options such as BootDelay and BootMenu will need to be added if you're going to tweak the bootup options.

Memory clash of the Titans

I'm upgrading my PC and don't know what kind of memory to purchase. If I'm using a 3D video card with EDO memory, do I get any benefit from using SDRAM for my system memory?

Charles Titone

Technical Editor Chris Dunphy replies: *If you're upgrading your PC, you rarely have a choice as to what kind of RAM you can use. Check your system's documentation, and go with its recommendations. If your motherboard provides sockets for both types of memory (EDO DRAM and SDRAM), then SDRAM is always the faster choice.*

The memory on your graphics card has no effect on the type of memory in your main system. Just go with whatever's fastest, and by improving your system in one area you'll likely see speed increases across the board.

Send your 12-Step Clinic questions to the Doctor at: clinic@bootnet.com

boot
white paper

YOUR PERSONAL TECH **BRIEFING** ON THE **CONCEPTS** AND **COMPONENTS** THAT MAKE UP THE **PC** EXPERIENCE

this month:

Understanding File Extensions

One of the vestiges of Windows' bastard youth as MS-DOS is the oh-so-cryptic three-letter file name extension. DOS originally limited file names to eight characters with a three-character extension identifying the file type. This eight-character limit has caused untold pain and suffering, leading to drives filled with BTWHTPR4.DOC or PIR8CRKZ.ZIP files. Just try remembering what's what in a directory filled with hundreds of these files, and you'll quickly go insane. Windows 95 has finally brought the serenity of long, descriptive file names to the PC crowd. But the specter of the 8.3 system still lurks beneath, hidden by pretty icons in Windows Explorer. This month's *White Paper* will guide you through this three-letter stew, and in the process you may even learn a thing or two about how your machine works.

If you have any topics you'd like to see dug up and digested in a future episode of the *White Paper*, drop me a line. Cheers!

— Chris Dunphy
(cdunphy@bootnet.com)

● ACTIVE ELEMENTS: .COM, .BAT, .EXE

A computer is only as useful as the programs it runs, and these three file types are what actually do the running.

The **.EXE** (think, executable) is by far the most common, and any DOS or Windows program is most likely one. A **.COM** file is rarer, and generally only found lurking in DOS. The most famous .COM file is COMMAND.COM, which can always be found at the root of your C: drive and is the MS-DOS executable itself.

A **.BAT** file (think, batch file) is written in simple DOS scripting language and is basically just a sequence of commands to be carried out. .BAT files can be used to automate tedious tasks or make shortcuts to start programs that require a lot of command-line parameters. The most important .BAT file on your machine is AUTOEXEC.BAT found at the root of your startup drive. It runs at boot-up, and configures your system from within DOS before Windows takes control.

● LIBRARY MADNESS: .DLL

To avoid continually reinventing the wheel (or reprogramming code to draw a window, send data to the modem, decode a JPEG, etc.), programmers create libraries of functions that they can then reuse for many different projects. When a program is compiled, these libraries can either be statically merged into an .EXE or they can be left as an entirely separate file, a **.DLL** (dynamically linked library).

The advantage of .DLLs is that the library code need only be loaded into memory when its particular functions are needed. Even if several programs use the same .DLL, there only needs to be one copy on disk and in memory. System resources are used more efficiently and bugs can be fixed without replacing the entire .EXE.

Just imagine how bloated program file size and memory consumption would be if they relied on static linking for all of their functionality.

Since .DLLs are meant to be used by more than one program, they tend to reside in the C:\WINDOWS or C:\WINDOWS\SYSTEM directory where they can easily be found.

Because of the shared nature of .DLLs, you should avoid manually deleting Windows programs from your system. Always use the uninstaller that's provided. It's usually found under the Add/Remove Programs control panel. If not, you may end up with unused .DLLs littering your hard drive, or worse yet, you may accidentally delete a .DLL that's being used by another program.

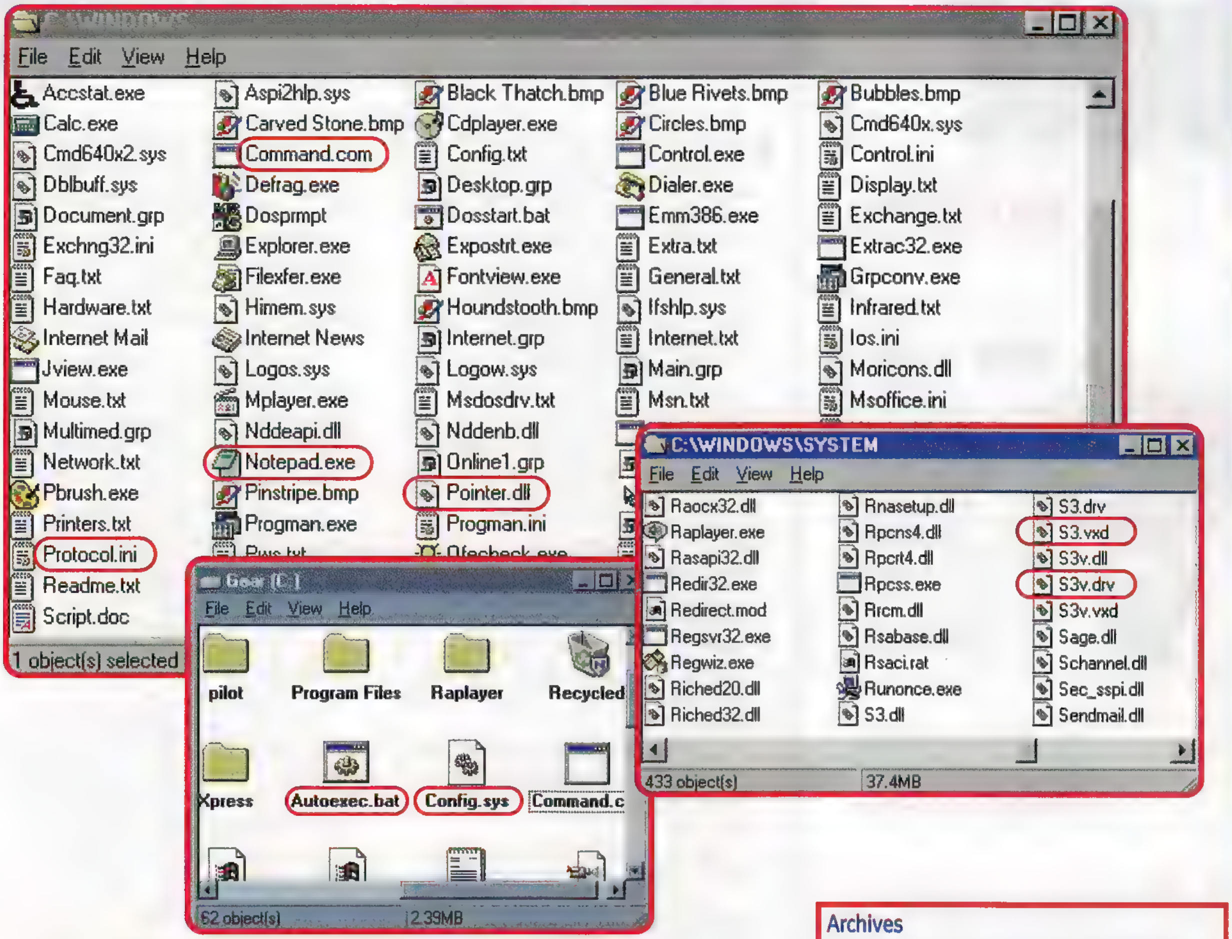
● BEHIND THE SCENES: .VXD, .386, .DRV, .INF, .SYS

Win95 is a complex beast juggling multiple programs at once and dealing with the thousands of possible hardware configurations, all the while straddling the fence between being a modern operating system and its brain-dead legacy of DOS.

Looking back at the history of **.SYS** files, they were originally DOS device drivers. One particularly special .SYS file is CONFIG.SYS, which lists all the other drivers to be loaded. Since DOS is far from dead, you'll have to muck with this file to configure a CD-ROM driver to play games in DOS mode, for example.

Windows 3.1 used **.386** files to extend the capabilities and performance of DOS, but Win95 junked that scheme for an entirely new driver architecture. Virtual device drivers (**.VXD**s) keep things sane when switching between programs. By creating virtual devices, .VXDs allow more than one program at a time to access a piece of hardware. **.DRV** files extend the capabilities of the built-in Windows default drivers to match your hardware.

Finally, **.INF** files tell Windows how to configure itself for new hardware and where to put the other driver files.


C:\WINDOWS
File Edit View Help
Accstat.exe
Calc.exe
Cmd640x2.sys
Dblbuff.sys
Document.grp
Exchng32.ini
Faq.txt
Hardware.txt
Internet Mail
Jview.exe
Mouse.txt
Multimed.grp
Network.txt
Pbrush.exe
Printers.txt
Protocol.ini
Readme.txt
Script.doc
Aspi2hlp.sys
Carved Stone.bmp
Command.com
Defrag.exe
Dosprmpt
Explorer.exe
Filexfer.exe
Himem.sys
Internet News
Logos.sys
Mplayer.exe
Nddeapi.dll
Notepad.exe
Pinstripe.bmp
Progman.exe
Pws.txt
Black Thatch.bmp
Cdplayer.exe
Config.txt
Desktop.grp
Dosstart.bat
Expostrt.exe
Fontview.exe
Houndstooth.bmp
Internet.grp
Logow.sys
Msdosdrv.txt
Nddenb.dll
Online1.grp
Pointer.dll
Progman.ini
Qfecheck.exe
Blue Rivets.bmp
Circles.bmp
Control.exe
Dialer.exe
Emm386.exe
Extra.txt
General.txt
Ifshlp.sys
Internet.txt
Main.grp
Msn.txt
Bubbles.bmp
Cmd640x.sys
Control.ini
Display.txt
Exchange.txt
Extrac32.exe
Grpconv.exe
Infrared.txt
Ios.ini
Moricons.dll
Msoffice.ini
1 object(s) selected
C:\WINDOWS\SYSTEM
File Edit View Help
Raocx32.dll
Raplayer.exe
Rasapi32.dll
Redir32.exe
Redirect.mod
Regsvr32.exe
Regwiz.exe
Riched20.dll
Riched32.dll
Rnasetup.dll
Rpcns4.dll
Rpcrt4.dll
Rpcss.exe
Rrcm.dll
Rsabase.dll
Rsaci.rat
Runonce.exe
S3.dll
S3.drv
S3.vxd
S3v.dll
S3v.drv
S3v.vxd
Sage.dll
Schannel.dll
Sec_sspi.dll
Sendmail.dll
433 object(s)
37.4MB
Gear (C:)
File Edit View Help
pilot
Program Files
Raplayer
Recycled
Xpress
Autoexec.bat
Config.sys
Command.c
62 object(s)
2.39MB

Configuring It All: .INI vs. the Registry

Previous versions of Windows used a clunky collection of **.INI** files to hold the settings and configuration information for itself and most programs. This has changed, for the most part, with the introduction of Win95 and the Registry.

The Registry is a database holding all the configuration information for your computer and for all of your applications. Using the Registry, independent configurations can be set up for different users, something not easily accomplished with .INI files. The Registry is also less likely to be corrupted by a poorly written application installer than the old WIN.INI and SYSTEM.INI.

If the Registry ever does get out of whack, run—don't walk—to a good Registry repair tool such as Symantec's *Norton Utilities*.

.REG files are portions of the Registry extracted into a text file for easy editing, backup, or transport. The SYSTEM.**DAT** and USER.DAT files contain the actual registry, split into two parts to allow a user's personal preferences to be stored on a network so the preferences can follow a user from machine to machine.

Data Types and Containers

There are hundreds of other three-letter file extensions lurking in your system. In most cases, the extension indicates what type of data the file contains, which program created the file, and even indicates if the file is an archive comprised of several other files. Here are a few of the more common and/or interesting file extensions you're likely to run across:

Archives

.ARC, .ARJ, .LZH, .ZIP, .ZOO—Common archive file formats, .ZIP being the reigning king.

Applications

.DOC	*Microsoft Word* document.
.PL	Perl language script.
.PM5	*PageMaker 5* file.
.XLS	*Excel* spreadsheet.

Data Types

.TXT	A general text document.
.BMP	A Windows bitmap graphic.
.GIF	A 256-color graphics format common on the net.
.HTM	A web page (labeled as .HTML on more civilized systems).
.JPG	A highly compressed true-color photo.
.MID	A MIDI music file.
.MOV	A QuickTime movie.
.MPG	An MPEG-compressed movie.
.PS	A PostScript file.
.RA	A Real Audio compressed sound file.

boot worthy

EACH MONTH, **BOOT** EDITORS GATHER THE BEST **PRODUCTS** IN A SPECIFIC CATEGORY AND DEEM THEM: BOOT**WORTHY**

this month: *Modems...*

Whether you're a casual surfer or you'd be the next in line to have a data plug implanted in your brain, the ability to get online is an essential piece of everyone's computing puzzle.

But not just any modem will do. Today's options for getting jacked in range from downright pathetic to gee-whiz cool, and the ever-increasing popularity and continuing importance of the net promise that your connection alternatives will be increasingly exciting.

Rather than round up the top-four traditional analog modems (yawn), this month's *bootWorthy* gives you a taste of some of the more interesting ways to jack in. Based on the products we've tested so far, we'll hip you to the pièce de résistance in each of the following categories: PCMCIA, ISDN, wireless, and of course, the now standard 33.6Kbps desktop modem. One of these Kbps bad boys should fulfil your online dreams. *boot* also gives you the story behind the 56Kbps hype and provides you with a taste of some of the other hot technologies that are on the rise.

At this rate it won't be long before everything and everyone is online all the time no matter where they are and what they're doing... Cool.

Global Village TelePort 33.6Kbps Speakerphone/Fax/Modem with SVD

Ironically, the best traditional modem we've seen is from a company better known on the Macintosh—Global Village. Their goofy looking external box, the TelePort 33.6Kbps Speakerphone/Fax/Modem with SVD (simultaneous voice/data), is the only PC modem they make and it's the coolest 33.6Kbps modem to come through the bootLab.

This external modem connects via a 9-pin serial cable (included). It has a built-in speaker with volume slider and a microphone. In addition, there's an answer on/off switch, mute button, and message-waiting light (which doubles as the data send/receive indicator). The back panel has jacks for an external speaker and microphone.

This modem isn't only feature rich, it's speedy, too. The TelePort continually clocked faster transfer rates when dialed into the *boot* offices than any of the other 33.6s we tested—we could swear we saw smoke.

Z-modem file transfer speeds range from 2185cps for raw binary data, up through an excellent 5685cps for ASCII text.

The *Focal Point* software installs easily, giving you an integrated voice-mail, fax, and e-mail center. *Focal Point* lets you do all the standard telephony jive and includes extras such as voice-annotated e-mail with a spell checker, and electronic hold that auto-detects other extensions being picked up. Caller-ID support is taken a step further with call return at the simple click of a button.

The TelePort's other talents include music on hold, conversation recording, and scheduled sending of faxes and e-mail messages. The fax subsystem provides OCR (optical character recognition) for turning your faxes into text files, as well as support for faxing directly for a TWAIN-compliant scanner. The TelePort also features AudioSpan SVD technology so you can carry on a voice conversation with a friend while you're connected to their SVD-compatible modem, with no need for a second telephone line.

You won't be disappointed with this modem. It has all the features you could want today, plus the promise of an inexpensive 56Kbps upgrade in the near future. For price, performance, and features, the Global Village TelePort 33.6Kbps is hard to beat.

Substance and Style: The Global Village TelePort modem may look like a piece of modern art, but it has a heart of pure modern technology.

SPEED: 33.6Kbps (upgradeable to 56K)

PRICE: $229
COMPANY: Global Village Communications Inc.
PHONE: 800.329.9675
URL: www.globalvillage.com/tpwhome/tpwhome.html

Olicom PCMCIA GoCard Eth/Modem 336

GoCard
COMBO

PRICE: $349
COMPANY: Olicom
PHONE: 972.423.7560
URL:www.olicom.com/products/oc-2232.html

SPEED: 33.6Kbps Modem/ 10Mbps Ethernet

If you're constantly on the go but need to stay in touch with the wired world, a mobile modem is a necessity. You'd be hard-pressed to find an inhabited spot on Earth where you couldn't rustle up a phone jack to help you get your e-mail fix. And if you can connect via Ethernet, then life's sweeter still.

The Olicom PCMCIA GoCard Eth/Modem 336 is what you'll want when you're venturing into the wild. With both 10BaseT Ethernet and a 33.6Kbps fax/modem on one slim PCMCIA card, no matter what type of plug presents itself, you'll be ready. You can even use the modem and network port simultaneously if you feel like going totally data crazy.

Under Win95 the GoCard supports Plug-and-Play installation and hot swapping for quick setup. And there's an equally simple installation procedure for Windows for Workgroups v3.11. The modem's power-management software lets you configure the GoCard for modem-only use to help conserve notebook battery life by powering down the Ethernet. You can also set it to prompt you for your on/off preferences at boot time—a thoughtful touch.

The GoCard supports all the expected 33.6 modem features and adds support for the MNP 10-EC protocol for cellular communications and maintaining connection during brief interruptions. It may have wanderlust lurking in its heart, but the GoCard's data transfer performance ranks right up there with the best desktop modems.

The Ethernet jack is your standard 10BaseT RJ-45 connector, with a coaxial 10Base2 adapter is an optional extra. Setting up on a foreign network for temporary access is quick and painless, needing only a little information from the local system administrator. Traveling has never been easier.

Delrina *WinFAX Lite* and *WinComm Lite* software are included to round out this excellent little package. It's amazing how much good stuff can be squeezed into such a small space.

56Kbps is Almost Here

We wanted to add a fifth category to this month's *bootWorthy*, giving you our impressions of the much-hyped and eagerly anticipated 56Kbps modems that have been due "any day now" since Fall Comdex.

Unfortunately, "any day" came just as this issue was going to press, and we didn't have a chance to get hands-on time with this new technology. But we can tell you what we do know: There are currently two incompatible standards being pushed to deliver 56Kbps speeds over the existing analog phone network.

K56 FLEX™

Modem giant U.S. Robotics is pushing their x2 technology, and most of their newer modems can be upgraded to support it. Most other modem makers have signed on to support a standard pushed by Lucent and Rockwell called K56flex. Just as with modem speed standards of the past, these competing protocols will almost certainly be unified as they pass through the international standards bodies, but in the meantime you have to be certain that your ISP makes the same choice you do.

USR's x2 seems to have the lead in signing up ISPs, using their clout as a modem server maker to snag AOL, MCI, Prodigy, and many others. (AOL leads the race to install 56Kbps-compatible dial-up lines, using the massive modem upgrades necessitated by their overloading fiasco as an opportunity to install the latest technology.)

U.S.Robotics X2 TECHNOLOGY™

The other thing you need to know about 56Kbps modems is that the speed boost is only one-way. Your connection upstream isn't accelerated and you get no speed benefits when dialing directly from one 56Kbps modem to another. Faster speeds are only evident when you call into an ISP that has their 56Kbps-compatible modem servers directly linked to the digital phone network. Check the sidebar "Breaking the Law" for the technical details.

U.S. Robotics Courier I-modem

If you've only cruised the Internet at 14.4Kbps, your first taste of ISDN will blow your socks off. Pages pop up before you have a chance to get to the kitchen and back for a snack, and the net seems like a shiny new world of speed and convenience. But if you've ever tried to get an ISDN connection set up, convenience is the last word on your mind.

Anyone who's taken the digital plunge will tell you that achieving ISDN's true potential is a headache. But while you can't control your phone company, your ISP, or the tariff laws in your state, you can control your hardware, and the Courier I-modem ISDN/V. 34 from U.S. Robotics is the best possible screamer you can have connected to your ISDN line.

Here's the rundown: The Courier I-modem is an ISDN TA (terminal adapter) and a 33.6/V.34 analog fax/modem in one. It comes as either an external box or as a PnP ISA card. On the analog modem front, it's flash ROM upgradable to the new 56Kbps standard, and features "V.Everything technology," which means it can connect to just about any older modem. Setup is as easy as the analog modems you're used to because the I-modem uses the standard AT command set and works with any communications software.

But now to the really cool stuff...

ISDN replaces your home phone line with a true all-digital connection to the phone company network. Typical ISDN service provides two 64Kbps channels, one of which can be used for data while the other provides a voice line. Typically, however, you'd like to bond these two "B channels" for a blazing 128Kbps of data speed. To help do this, U.S. Robotics provides *Multilink PPP* software and a feature it calls "Bandwidth-on-Demand" to dynamically negotiate the best connection for your ISDN call.

Most ISDN TAs don't have an analog modem built in. You generally have to keep your analog modem around for when you need to connect to a non-ISDN service, and switching back and forth is tedious. But the Courier I-modem uses Universal Connect to automatically determine whether or not to place a call with its ISDN TA or its analog fax/modem. For example, if you want to send a fax (an analog connection), the I-modem figures it out and switches to the 33.6; if you want to get on the web, it automatically switches back to ISDN.

We love everything about the Courier I-modem—it makes ISDN as simple and painless as it can be, and it's also a full-featured analog 33.6 fax/modem, so you give up nothing by going to ISDN. You just can't beat it.

COURIER I-modem
with ISDN/V.34
RD
DTR
RTS
CTS
SYNC
ANS/FAX

PRICE: external: $399; internal: $339
COMPANY: U.S. Robotics
PHONE: 800.342.5877
URL: www.usr.com

SPEED: 33.6Kbps analog / 128Kbps ISDN

Breaking the Law

Shannon's Law declares that the maximum amount of data that's able to be encoded into a signal is proportional to the bandwidth and signal-to-noise ratio of the wire the data's being sent across.

Even with a very clean, noise-free line, the maximum possible speed over the analog phone network's 3kHz voice channels is around 35Kbps. Going any faster would be akin to outpacing the speed of light. If that's the case, today's 33.6Kbps modems are pushing the limit of data transmission as far as the law says it can go.

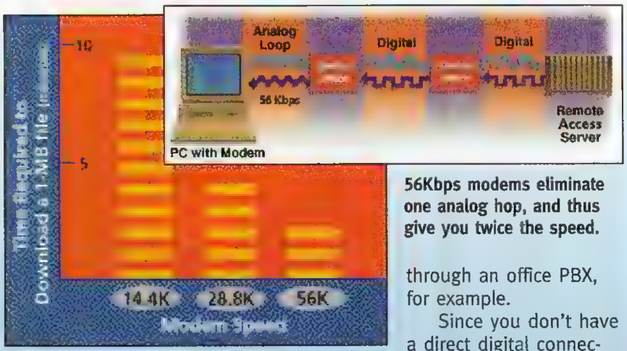
So, how the hell can 56Kbps modem technology get away with breaking the law?

The secret lies in knowing that the digital network carrying voice traffic uses 64Kbps per line, because to digitize an analog voice signal at 3kHz quality you need to capture it at twice that rate.

The 56Kbps modems take advantage of the fact that AOL and other big ISPs have a direct digital connection to the phone network, and they skip the analog-to-digital conversion on the upstream end. This preserves the bandwidth of the full digital channel all the way to the last hop across the phone network to your house, giving 56Kbps downstream. Of course, if any extra analog switching equipment exists on the line between your modem and the DAC at the phone company's substation, 56Kbps won't work for you. Good luck getting a 56Kbps signal through an office PBX, for example.

Since you don't have a direct digital connection to the phone network, you'll never be able to send data much faster than 33.6Kbps upstream. Shannon's Law is still very much in effect.

Now, if you did have a direct digital connection to the network you could cruise along with 56Kbps upstream, too. Hey wait, that's called ISDN!



56Kbps modems eliminate one analog hop, and thus give you twice the speed.

Ricochet Wireless Modem

There are lots of ways to get wireless on the net these days and most of them cost an arm and a leg—except the Ricochet. Other wireless alternatives charge you by the minute over a cell-phone network or by the byte over paging and wireless messaging systems. While this may be fine for occasionally checking your e-mail, these services are primarily one-way by nature and/or their costs make everyday surfing expensive. But, for a flat monthly fee, a Ricochet modem can do everything your traditional modem can do, except plug into the wall.

The Ricochet uses a spread-spectrum, frequency hopping transmission system that transmits data packets on randomly selected channels throughout the license-free 902-928MHz band of the radio spectrum—the same range used by garage-door openers and new cordless phones. To operate without a license, the radios must transmit with only one watt of power, giving them limited range. To get around this, Metricom mounts repeater radios on street lights and the top of buildings at intervals of approximately one square mile. Your data signal may bounce through several repeaters before hitting a wired access point and connecting to the net, hence the Ricochet name.

Getting things up and running is completely simple. Your computer recognizes the Ricochet modem as a generic 28.8Kbps modem. It uses standard AT commands and getting on the Internet with a PPP connection just involves dialing a special number and then connecting to Ricochet as the ISP.

In use, you'll see speeds ranging from 2400bps to greater than 33.6Kbps depending on your signal strength, the number of repeaters within range, and how many hops it takes your data signal to reach the nearest wired point. The speed numbers can be deceptive—the raw data speed between Ricochet radios is 100Kbps, which is nearly ISDN speed. But it's the latency that kills you; the lag added by multiple radio hops quickly leads to slower response times and slower throughput.

Surprisingly, the Ricochet is just as useful plugged into a desktop machine as it is on the road with your notebook. Using a Ricochet at home, you can stay connected to the net all the time with no need for a second line or an ISP. In fact, the Ricochet is probably the only affordable way to give your home machine a full-time Internet connection—just try tying up a line all day every day with your ISP, and they'll call you darn quick to explain their own interpretation of "unlimited use."

The Ricochet's main downside is its limited availability. Metricom has deployed repeater radios throughout the San Francisco Bay Area, in parts of Washington and Oregon, and in the Washington, D.C. metropolitan area. Several major airports, universities, and a few hotels have also been wired for wireless, and Los Angeles is coming online soon.

Check the Ricochet web site to find out if your town is on the short-list to get wireless. If not, don't despair. The FCC recently allocated more bandwidth to unlicensed data networking, and LEO (low-earth orbit) satellites are on the horizon, so the Ricochet won't be the only affordable wireless game in town for long. All you could possibly want now is a clip-on version of the next Ricochet for your Pilot PDA—that would truly be mobile nirvana.

PRICE: $39.95/month for modem rental, POP e-mail account, and unlimited Internet
COMPANY: Metricom
PHONE: 800.556.6123
URL: www.ricochet.net

SPEED: 14.4Kbps to 28.8Kbps typical speed

Future Pipes

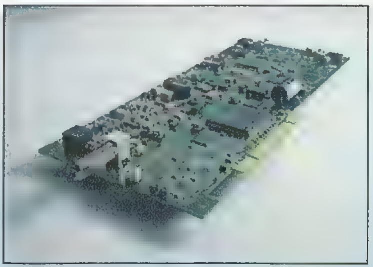
Sure, 56Kbps seems fast compared to the 2400bps speed that was common just a few years ago, but just a few years ago all we did online was read plain text and download an occasional small game. With the Internet growing rapidly and web sites trying to outdo each other with multimedia pizzazz, even an ISDN connection is starting to feel slower than the 2400bps of the past.

Fortunately, there are a few technological miracles on the horizon that will keep us speeding along. Unfortunately, all of them require that a lot of new infrastructure be built, and none of them are a sure thing yet.

The basic options being pursued are cable modems, enhanced use of copper phone lines, and going wireless. Here's a quick look at how things are shaping up.

The cable TV infrastructure brings a big fat coax pipe into the majority of homes in the United States, but the system is not engineered to be digital or two-way. When it works—as is currently being demonstrated in a few test cities—cable modems can deliver more than 10Mbps downstream speed and still allow over 1Mbps upstream. But because the cable wires are shared from house to house, all that juicy bandwidth is divided up among everyone logged on at the same time in one neighborhood.

ADSL (asymmetrical digital subscriber line) places special advanced modems at either end of the local wiring loop to take advantage of the copper phone line running into your house. ADSL can manage downstream speeds of around 6Mbps, and upstream speeds of 640Kbps should be common. With ADSL you don't need to share bandwidth with your neighbors, but one thing that may slow the advent of ADSL is the unwillingness of phone companies to kill a few old cash cows. It will be hard for them to justify to companies that they pay $20,000 a year for a 1.54Mbps T1 connection when on the consumer side they are selling much faster connections for just $50 a month.



Cable modems, such as this one, may soon be turbo-charging your online experience.

The wireless options are not as well-defined, but may leapfrog both ADSL and cable modems—once you have the satellites or radio towers in place, there's no need to deal with expensive and time-consuming local-area wiring. The FCC has recently opened more bandwidth for wireless terrestrial data, and all of the minidish satellite operators are looking to start providing at least downstream data service in the near future.

boot previews

HARDWARE
ON THE HORIZON AND
SOFTWARE SOON TO SHIP

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69 Into the **Fire**
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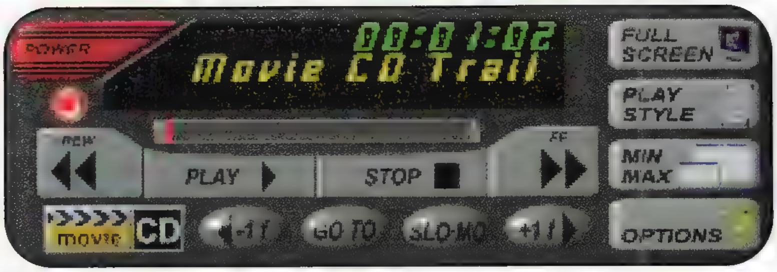
72 Cyrix **MediaGX**

The boot Tracking Sheet

TITLE	DEVELOPER	DATE
Netscape Communicator	Netscape	5/97
Red Baron II	Sierra	5/97
Rebellion	LucasArts	5/97
Hexen II	Raven/id	5/97
Fallout	Interplay	5/97
Softimage v3.7	Microsoft	6/97
Quest For Glory: Dragonfire	Sierra	6/97
Corel Office Professional 8.0	Corel	7/97
Descent To Undermountain	Interplay	7/97
The Curse of Monkey Island	LucasArts	6/97
Flight Unlimited II	Looking Glass Technologies	6/97
Grand Prix Legends	Papyrus	6/97
Unreal	Epic MegaGames	6/97
VR Baseball '97	Interplay	9/97
NetStorm	Activision	9/97
Crusader III	Origin	9/97
The Dark Project	Looking Glass Technologies	12/97
Dark Vengeance	Reality Bytes	12/97
Mask of Eternity	Sierra	12/97
10th Planet	Bethesda	12/97
Ultima IX	Origin	12/97
Prey	3D Realms	3/98
MMX 2	Intel	4/98
MechWarrior III	FASA	Q2/98
Indestructibles	Bullfrog	on hold
Creation	Bullfrog	on hold
Wing Commander V	Origin	starting production

*These dates are subject to change

S/W



Long flight blues? Pop in a MovieCD to kill the time.

Sirius **MovieCD**

Hollywood without the MPEG price...

The VideoCD format was a bigger flop than Betamax. Few people ever bought the hardware decoder to play back VideoCDs, and only the most recent Pentiums could handle playback in software. In the Far East (where karaoke is king) the format may be hot, but in the United States few people are aware they can get VHS-quality movies on a CD-ROM. If U.S. consumers soundly rejected VideoCDs, why would Sirius bring out totally proprietary movies on CD-ROM format, particularly today, in the dawn of the DVD age? The answer is simple: volume.

H/W

Exabyte Eagle DMi

Stories of tape's demise are greatly exaggerated

Tape is dead, right? Banished for its sluggish access time and unreliable media? Well, just when you thought you could seal the tomb, this Methuselah rises again.

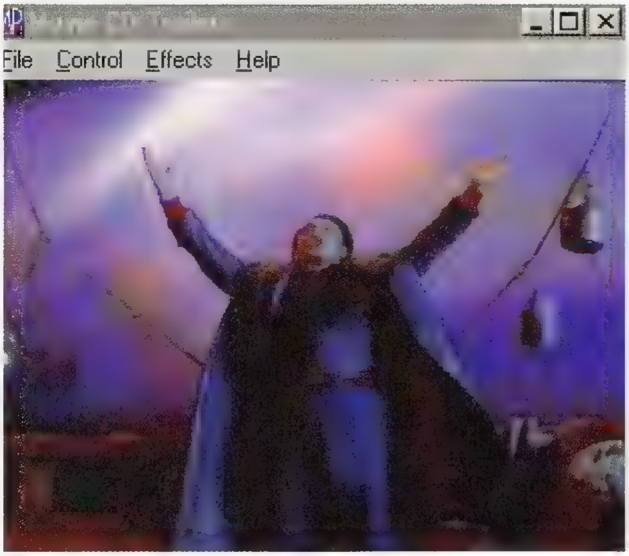
While everyone's waiting in line to sell their soul to DVD, the Eagle DMi is Exabyte's messiah of mass storage. A proposed universal tape drive standard, this new device will use DigaMax technology to perform technological miracles in an attempt to get people to follow its lead.

Miracles? How about capacities of up to 13GB of uncompressed data (26GB compressed), and data transfer rates varying from 0.5MB/sec to 2MB/sec uncompressed (1MB/sec to 4MB/sec compressed)?

MPEG-2 requires that a drive must be able to sustain a variable transfer rate of at least 1.8MB/sec, and the Eagle DMi promises to deliver all that and more with MPEG-2's compression ratio. Imagine storing as many as five full-length movies on one piece of media.

The Eagle DMi's speed is the result of an eight-channel recording head, as opposed to the standard single-channel head. This parallel recording technique will allow the Eagle DMi to lay down more data in one pass, pushing a higher transfer rate. This process also slows the tape speed, thus reducing wear and tear on the media and increasing its reliability. With an MTBF of 200,000 hours, this makes the Eagle DMi a head-to-head competitor with the 250,000-hour MTBF posted by SyQuest's 1.5GB SyJet.

All this goodness comes at a price. Hard drives typically run about $200/GB, DVD-RAM should be about $10/GB. But the tape for Eagle DMi runs *less* than $2/GB.



Long flight blues? Pop in a MovieCD to kill the time.

While MPEG playback is limited to a few capable machines and widespread DVD penetration is still years away, Sirius has invented a proprietary video codec called Motion Pixels that can be played back on even a 486/66 with a 2x CD-ROM. Well over 25 million machines are MovieCD-ready, and to ensure customers get a chance to try it, MovieCDs will sell everywhere—from airport gift shops to computer mega-marts—at impulse-buy prices as low as $9.95.

The quality of MovieCD video is excellent. Though nowhere near the "better than laserdisc" of DVD, and falling short of the "VHS quality" of MPEG-1, the Motion Pixels encoded footage we saw was still strikingly good considering the minimal playback requirements. Even if your graphics card doesn't support hardware scaling, the software scaler does an excellent job of filling the screen with action. Sixty minutes of video per disc is encoded in 16-bit color at 320x240 and 15fps. We saw lots of compression artifacts, but they were rarely distracting, and audio/video synced well.

Audio quality is significantly poorer than the CD quality (16-bit, 44kHz stereo) of MPEG-1 discs. MovieCD movies tend to be encoded with 8-bit, 22kHz mono soundtracks, while music video MovieCDs use 8-bit 22kHz stereo. Sirius is working on improving the sound quality of future discs, but using 16-bit audio may cause compatibility problems with older sound cards.

The real test of a format is the number of titles available. Sirius has done a good job lining up 50 titles for launch, and 500 more slated by the end of the year. Content includes everything from feature films to the best of *Saturday Night Live* to Japanese Anime to classics such as *Reefer Madness*. Check the MovieCD web site for the latest releases and download a clip or two to see the image quality for yourself. Later this year Sirius will launch (under a different name) a second line of adult-oriented material using the same technology.

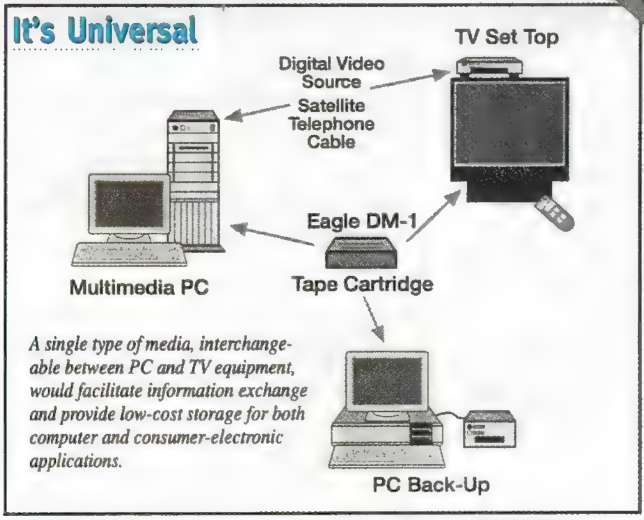
The MovieCD format won't replace your VHS deck and it's no threat to DVD. What it will do is allow you to watch video programming inexpensively on just about any PC. If you've ever been stuck on an airplane with a crappy in-flight movie, a good dose of MovieCD-powered *SNL* on your notebook just might be paradise.

— *Chris Dunphy*

product info

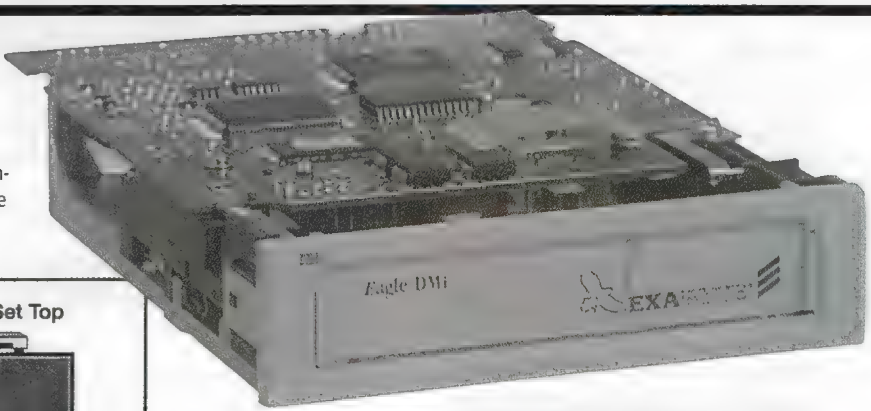
AVAILABILITY: 50 titles now; 500 by year's end
PRICE: $9.95 to $24.95
COMPANY: Sirius Publishing
PHONE: 602.951.3288
URL: www.moviecd.com

The E-IDE drive itself will fit either as a 5.25-inch standard formfactor internal unit or as part of Exabyte's Eagle Nest universal storage bay system, so you can hot swap the drive with no need for free drive bays.



A single type of media, interchangeable between PC and TV equipment, would facilitate information exchange and provide low-cost storage for both computer and consumer-electronic applications.

Exabyte's Eagle DMi preaches the gospel of 26GB of compressed data on one tape cartridge, flying at speeds of up to 2MB/sec! Dig it.



There's no need to wait until the year 2000 for DVD-RAM to make it to your desk, when instead, you can get the Eagle DMi this year.

But the Eagle DMi isn't just a massive storage solution. Envision multi-platform usability for the Eagle DMi, including WebTV box storage, and Digital TV storage medium, and you can start to see where this tape drive *can* come in handy.

With the Eagle DMi, Exabyte hopes to resurrect the tape drive and kick the stuffing out of false idols such as DAT, Digital Linear Tape, DVD, and D-VHS.

— *Chris Dunphy*

product info

AVAILABLE: Q4 97
PRICE: less than $500
COMPANY: Exabyte Corp.
PHONE: 800.392.2983
URL: www.exabyte.com

Forgotten **Realms:** **Descent** To Undermountain

Going down... medieval style

A lone goblin faces the fury of your cold steel.

Sharpen your swords and gather your party of adventurers for Interplay and Parallax Software's long-awaited Forgotten Realms: Descent to Undermountain.

Dungeon crawl with the highly optimized Descent *engine, throw in some liberal licensing from TSR's Advanced Dungeons & Dragons and you have the makings of role-playing magic.*

boot *goes spelunking with producer Reginald Arnedo, lead programmer Andrew Pal, lead designers Chris Avellone and Robert Hanz, and lead artist Kevin Beardslee (collectively known as the DTU Team).*

boot: Why use the *Descent* engine in an RPG?

DTU Team: Originally the goal was to use the *Descent* engine and create an online game. As the game progressed the scope changed completely. Now we have a huge action RPG that takes the *Descent* engine to its limits.

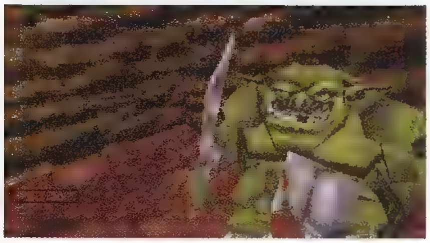
boot: How was the *Descent* engine tweaked for *Descent to Undermountain*?

DTU Team: The physics engine was entirely replaced. We didn't want our creatures moving around like *Descent* ships. The resource system was rewritten to handle over 500MB of textures. The engine has also been sped up to handle a lot more complex polygons.

Plus, you can now go from level to level and back again. We have 75-or-so weapons and armor, and a built-in inventory handling system that a standard *Descent* ship doesn't have.

boot: How has the polygon-rendering engine been beefed up?

DTU Team: New sorting code speeds up the engine by about 200 percent. Instead of the "make it fast and forget the gameplay" theory, we used the savings to enhance the game: Visually stunning spell effects, glowing lava pools, running water, exploding fumaroles, flickering torches, stained-glass doors, the best infravision anywhere, volumetric fireball explosions, and the biggest damn dragon you've ever seen. We also have a lot of environmental material—cobwebs, rats, etc.—to make the dungeon more than just an empty maze.



Hack into the polygon body of an orc and watch the blood spray.

boot: Will any 2D sprites be lurking in *Undermountain*?

DTU Team: Everything that works best as polygons is polygons, but certain objects just look better as 2D mapped into 3D. If you try to create a potion or a complex weapon in 3D you're either going to eat a lot of polygons and slow the machine, or have inane-looking objects.

Prepare to spill some goblin blood in *Descent to Undermountain.*

***Descent to Undermountain*'s lighting effects promise to dazzle and amaze.**

boot: What kind of horrors can we expect? How many will there be?

DTU Team: We have about 50 bad guys, not including variations, with 235 polygon counts for the smaller beasts and 300 to 350 polygons for the bigger ones.

boot: *Undermountain* promises richer texture maps than *Quake* or *Duke 3D*. How so?

DTU Team: We're using more than 300MB of 64x64 textures. While 64X64 doesn't sound like much, we use more textures in an area than most games do. So, in any one room, we might stack three 64X64 textures on top of each other, effectively giving us a 64X64X3 texture. Smaller textures let us have more detail.

As a lot of recent 3D games have shown, without a decent texture artist your objects look like garbage, no matter how many polygons you use. We're fortunate to have one of the best texture artists around.

boot: Is *Undermountain* a "real" RPG or an action game with RPG elements?

DTU Team: It's an action-oriented RPG. You'll encounter and interact with characters and there are story based puzzles, but most of the challenges test your fighting and reaction skills.

boot: Besides cooperative multiplayer gaming, will there be a deathmatch-style mode?

DTU Team: We're working on both. Each has distinct advantages and disadvantages. Magicians can cast big, destructive spells, but if they aren't careful with their fireballs, a lot of the co-op games will probably turn into deathmatches.

boot: Will there be any solo adventure action?

DTU Team: Right now, you can tackle the dungeon alone, but the game's intended to be a cooperative multiplayer experience. Players should network with friends to solve the game together, much like a traditional AD&D gaming session.

boot: How much character building will there be?

DTU Team: Tons. First off, in character creation... you choose from human, elf, dark elf, half-elf, dwarf, or halfling; male or female; and then from any of four classes or a combination of classes: thief, mage, fighter, and priest. Tailor your character's profession, skills, and stats to your style of play.

This isn't *Doom* or *Quake*... your character improves over time. Every monster you defeat and each puzzle you solve makes you stronger. As you descend deeper into Undermountain you'll need all the power you can get to survive.

boot: How will combat be handled?

DTU Team: Hand-to-hand combat is similar to *Quake* but is taken to the next level. You have to duck into range just long enough to get your shot in and then back up. It sounds complicated, but it's pretty seamless in the game. you're just watching the blood spray and the bodies fall.

As far as spells go, the fireball rocks. Cast it in a hallway and watch the flames come down the corridor. The flames go around columns and fry everything. Magic missiles are cool, too. Especially when five of them converge on a target, like a swarm of wasps.

boot: Besides the monsters, what should adventurers be on the watch for?

DTU Team: Traps. Our designer is an absolute sadist. After playing *Descent to Undermountain*, I guarantee people won't just open doors and charge into rooms anymore.

— *Andrew Sanchez*

product **info**

AVAILABLE: aug 97
PRICE: TBA
DEVELOPER: Parallax Software
PUBLISHER: Interplay
PHONE: 800.454.6064
URL: www.interplay.com

H/W

Intel's 430TX vs. the AMD-640 Chipset

The battle for high-powered PCIset supremacy

82371AB
intel
82439TX
intel

The 430TX is Intel's fifth-generation PCIset, but is it beginning to show signs of age?

Does the amount of L2 cache *really* make a difference? AMD thinks so, and is ready to unleash their newest technological achievement upon a world barely recovered from the launch of Intel's 57 new instruction sets.

But no matter which CPU tickles your fancy, one thing remains constant: Without the proper chipset to take advantage of new technologies such as USB and SDRAM, you might as well try playing *Unreal* on a decrepit old 8088. Performance should *never* be compromised because of substandard core circuitry.

Enter, two new flavors to the PCIset: Intel's 430TX and the AMD-640 Chipset, ready to mix it up with your favorite motherboard and eager to drink deeply from your CPU. While both PCIsets claim Socket 7-based MMX processor optimization, you'll be surprised to see what each company has up their sleeve.

The 430TX has a helluva lot to live up to. Many people complained about the wishy washy design parameters of the 430VX and the 430HX PCIsets, and how all the features, such as USB support, 512MB of system RAM, and SDRAM support should have gone into just one chipset. With the two-chip 430TX, comprised of the 82439TX System Controller and the 82371AB PCI I/O ISA/IDE Xcelerator, this fifth-generation PCIset tries to please the masses with more action-packed features than previous chipsets.

Does the 430TX support 512MB of RAM?

Unfortunately, the answer is no.The PCIset peters out at 256MB of system RAM. Worse still, only 64MB is cacheable.

So, what *does* the 430TX have to offer?

Ultra DMA, also known as UltraDMA/33, will give EIDE peripherals connected to the motherboard the high-performance data transfer rates that have been denied to them for so long. With transfer rates of up to 33MB/sec, Ultra DMA is designed to go head-to-head with Fast-Wide SCSI-2... *without* giving up a precious PCI slot. Provided, of course, that you have the Ultra DMA hardware to take advantage of this new process.

Also, the 430TX inherits the 430VX's penchant for SDRAM support. Dynamic Power Management provides enhanced power saving in mobile applications, as well as newer desktop power-saving techniques via ACPI (Advanced Configuration and Power Interface). The ability to bus master a fifth PCI slot also comes in handy.

CPU overclockers will have to look elsewhere, as the 430TX officially hits the 66MHz bus speed limit. With the amount of L2 cache the 430TX can handle peaking at *512K* of pipeline-burst SRAM, how about something for those who want more?

The AMD-640 Chipset is born from AMD's close alliance with VIA, makers of the Apollo-VP chipset, in an effort to combat Intel's influence in the core PCI chipset market. Made up of two chips, the AMD-640 System Controller and the AMD-645 Peripheral Bus Controller, this dynamic duo can give you cache-crazy monkeys what you want.

On top of Ultra DMA support, 66MHz bus speeds, DIMM/SDRAM and USB support, the K6-optimized AMD-640 Chipset offers two very important features that will have you drooling and will make you forget all about Intel.

How does 512MB of system RAM strike you? *All* of it cacheable! Breaking past the 430TX's 256MB limit is one thing the AMD-640 promises to do, but it remains to be seen how much L2 cache this PCIset can handle.

AMD is claiming that a whopping 2MB of L2 cache is possible. Considering many motherboard manufacturers had problems getting VIA's Apollo-VP chipset to work with only 1MB, 2MB seems impossible. But, AMD proudly boasts about this feature and we can only hope that the circuitry is ready to rock 'n' roll when it's time to hit the market.

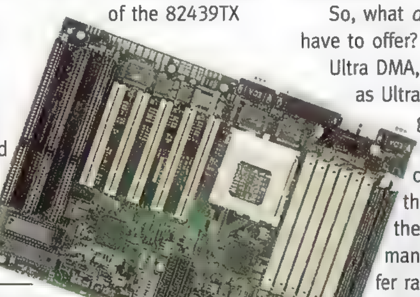
Taking a look at the National Microcomputer Expert MMX 200 system, reviewed on page 94, shows that there is a measurable difference between 256K and 512K. Making the jump from 512K to 2MB, however, becomes a question of diminishing returns. Will 2MB of L2 cache really make a difference in system performance?

We hope so.

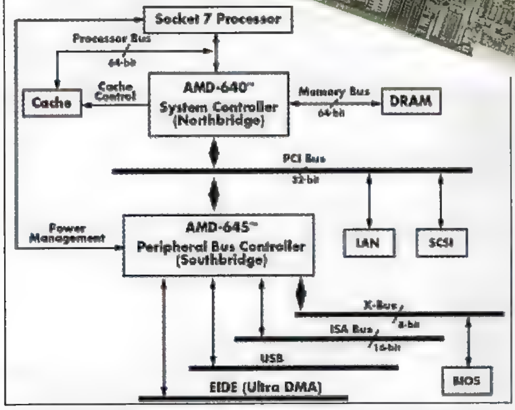
— Andrew Sanchez

Other Chipset Feature Comparison

CHIPSET FEATURES	AMD-640	INTEL 430TX
Cache Transfer Timing	3-1-1-1-1-1-1-1	3-1-1-1-1-1-1-1
ECC	Yes	No
Distributed DMA	Yes	Yes
SDRAM Transfer Timing	5-1-1-1	5-1-1-1
CPU/Cache to DRAM Write Buffers	16QW	No data
RTC	Yes	Yes
AGP	Yes	TBA



Look for these shiny, new PCIsets in the latest motherboards from your favorite manufacturer.



A fully cacheable main memory and 2MB of L2 cache should give Intel something to think about.

product info

PRODUCT: 430TX
AVAILABLE: now
PRICE: TBA
COMPANY: Intel
PHONE: 800.628.8686
URL: developer.intel.com

product info

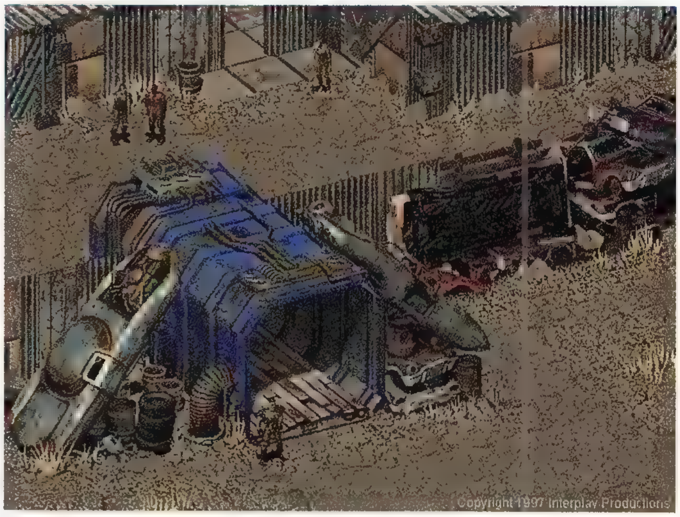
PRODUCT: AMD-640 Chipset
AVAILABLE: Q2 97
PRICE: $32.85 each in 1,000-unit quantities
COMPANY: Advanced Micro Devices
PHONE: 800.222.9323
URL: www.amd.com

Fallout: A Post Nuclear Adventure

Living in oblivion

Battling hordes of post-nuclear monstrosities with a semiautomatic in hand is not a new concept—indeed, Interplay's classic RPG, Wasteland, *dealt with surviving in a desolate post-apocalyptic world. But, with today's kick-ass computer systems it's high time someone tackled the concept once more—this time prepare to get busy in Interplay's* Fallout: A Post Nuclear Adventure.

Project Leader **Tim Cain** *shows* boot *that living in oblivion ain't so bad... as long as you're armed and dangerous.*



***Fallout*'s isometric world will be filled with sharp SVGA details.**

boot: What's the story behind *Fallout?*

Cain: Eighty years after a nuclear war, you are the descendant of those lucky few who made it into an underground shelter called Vault 13. With your vault's water purification system failing, you must brave the upper world to find a replacement microchip in another vault and save your people.

boot: Is this a *Wasteland* sequel?

Cain: Not really, but *Fallout* was designed in the spirit of *Wasteland.* Technological advances let us improve that classic game, both in graphics and the depth of storyline.

boot: Will this be a solitary adventure or will you be controlling a party?

Cain: This is a solo game, but friends you make in the wasteland will help you out with equipment, clues, and fighting.

boot: Can you elaborate on the gaming engine you've come up with in *Fallout?* Why go with a turn-based combat system rather than a real-time engine?

Cain: We've made a third-person, isometric game engine with a dynamic lighting model. You can explore dark caves and sewers, lit *and* unlit buildings, and towns and cities during the day *and* night. You can explore subterranean vaults and caves as well as roam through ruined cities, abandoned military bases, and desert wasteland. We've made lots of different wall and ground sets so the world doesn't look the same everywhere you go.

You can interact with this world, whether you're lock picking a door or bartering with a shopkeeper. As you gain experience, your skills improve and you can select additional bonuses tailored to your character's development.

You explore in real time, but we went with a turn-based combat system primarily to get away from the twitch-based combat in other RPGs. We also like the strategic elements that come into play when you have time to consider your move, attack, and defense combinations.

boot: Since it's billed as an RPG, what kind of quests will players be involved in? Will we have a "living" world, à la *Ultima,* where NPCs do their own thing?

Cain: Your first quest is to find and replace the damaged water purification system's microchip. Along the way you'll encounter people and situations with their own unique problems. We strongly encourage players to role-play any kind of character they want and accept the consequences of their actions. If you're a nice, well-spoken character, then people will tend to like you and offer to help you out.

Act badly and you might find yourself staring at the business end of a submachine gun. Depending on how the player develops their character, different quests will be available and different quest solutions will be possible.

boot: What kinds of monsters will roam *Fallout*'s countryside?

Cain: The wasteland teams with giant rats, wild dogs, radioactive scorpions, killer robots, and the dreaded two-headed mutant cow.

boot: Some of the NPCs look great. How were the graphics in *Fallout* created?

Cain: Most of the sprites, cut scenes, and movies were created with *Alias* on an SGI or *LightWave 3D* on a PC. However, our talking NPC heads were sculpted in clay and then scanned in 3D. *LightWave* was used to texture and animate the resulting images.

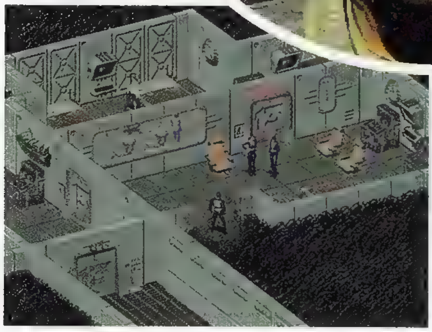
boot: Will *Fallout* use any type of hardware acceleration? MMX?

Cain: No.

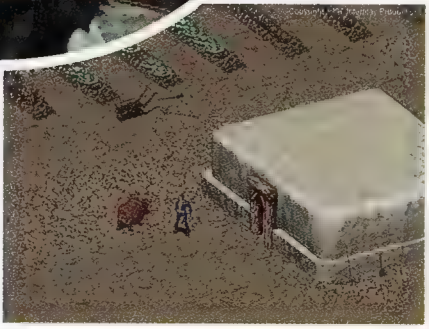
boot: What size sprites are we looking at?

Cain: The player is 15x80, while a rat is just 25x20. A radioactive scorpion is huge at 90x75, and when it explodes chunks go everywhere. It's a mess to clean.

***LightWave 3D* and clay modeling were used to make *Fallout*'s characters come alive.**



Contemplate your next move deep within the safe confines of the Vault.



"Where's the beef?" In *Fallout,* it's probably better that you don't know.

product info

AVAILABLE: july 97
PRICE: TBA
DEVELOPER: Interplay
PUBLISHER: Interplay
PHONE: 800.468.3772
URL: www.interplay.com

S/W

Into the **Fire**

Play it again, Sam

Humphrey Bogart is one of the greatest movie stars of all time. And now, 40 years after his death, Bogey is making a comeback in an interactive adventure game tentatively titled, Into the Fire. *We spoke to producer* ***Jeff Klein*** *to find out what it takes to raise the dead.*

boot: What's the premise behind this innovative new concept?

Klein: The game will completely absorb the player into a new "hard-boiled" detective movie, similar to those of the 1930s and '40s.

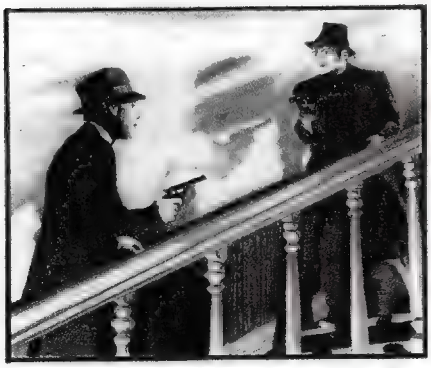
The black-and-white digitally rendered 3D backgrounds and characters will set the stage, and the player will team up with Humphrey Bogart as Detective Jake Malone as he tries to uncover the most dangerous and mysterious case of his career. The story will send Malone on a mysterious adventure that begins with a brutal murder in San Francisco and leads to a trail of deceit and corruption spanning the Pacific... to the Orient!

boot: What kind of interface will this interactive movie sport?

Klein: The player will have complete control of Malone's actions including interviewing suspects and witnesses, controlling his movements, and locating and manipulating objects and weapons.

The game will feature all of Bogey's famous trademarks.

The on-screen interface will combine fluid, 3D first-person perspective (similar to *Under A Killing Moon*), third-person perspective (similar to *Tomb Raider*), and a variety of other cinematic angles that will be seamlessly integrated to heighten and support the on-screen action. Gameplay will involve investigating, puzzle solving, and exciting fast-paced action as Detective Malone battles menacing street thugs, corrupt law enforcement, sinister villains from the Chinese underground, and double-crossing dames!



Interact with other film characters and detectives.

boot: How are you bringing Bogey back to life?

Klein: Our goal is to create a convincing 3D/photorealistic Humphrey Bogart model to interact with our cast of contemporary talent (including some major screen stars of today).

First, using a 3D life cast of Bogart's head and other visual references, our modeling team renders the 3D wireframe. After the wireframe is complete, 2D facial features from Bogart's archival footage and still images are scanned to create a bitmap mask. The mask is then wrapped around the 3D head. Next, the animator adds skin texture to the body and creates textured clothing.

With the 3D Bogart model complete, we use "facial capture" techniques to create realistic mouth movement, lip sync, and facial expressions. Using special video cameras we capture the body movement and actions of a performer and record the information. Combined with our rendered model, this realistic motion brings Bogart back to life.

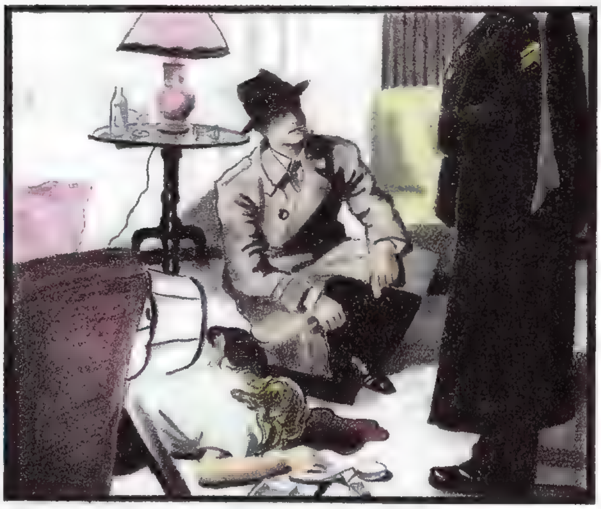
boot: What is a "Digital Backlot"?

Klein: The Digital Backlot process is used to digitally re-create Alcatraz and entire city blocks of San Francisco and Shanghai. We capture actual streets, building, interiors, and other locations, which have the '30s look and which work for our story on digital video. The images are then cleaned up and extruded into 3D structures. We then apply the photographic texture map directly to the 3D geometry, creating a striking photo-realistic 3D result. The completed structures and interiors are then placed in our digital environments for the player to explore.

boot: Are you incorporating online elements?

Klein: About four months prior to our game we'll launch a special web site featuring an episodic prequel. Visitors can win a trip to one of the game's locations (either San Francisco or Asia).

Also included will be access to our online, 3D, 1930's San Francisco Underground Nightclub.



Although these pencil sketches look mighty fine, Cortina Entertainment promises *Into the Fire* will use realistic 3D rendering instead.

The black and white environment will allow the player to assume their favorite hard-boiled avatar and interact with other players. The nightclub will feature gambling, real-time swing and jazz concerts from top performing and recording artists, and virtual chat allowing online gumshoes to share their investigative process and important clues.

boot: Do you have a license to use the Bogart name and likeness?

Klein: We have an exclusive license with the Humphrey Bogart Estate and CMG Worldwide. Humphrey Bogart's son Steven and his daughter Leslie are closely involved in the game development and approval process.

boot: What development software are you using?

Klein: We're using *Lightscape* and *Form Z* for our Digital Backlot process in conjunction with *Game Gen* for asset management, prototyping, and authoring; and *SoftImage* for the facial modeling of Bogart in conjunction with a real-time toolset called *Geppetto*. Since our palette will only be 8-bit black and white (to achieve the classic Bogart movie look), we'll have an unprecedented polygon budget and unprecedented speed.

boot: What hardware acceleration are you planning to support?

Klein: At this time, Direct 3D, MMX, and the 3Dfx Voodoo chipset.

boot: How many hours of gameplay can we expect from *Into the Fire*?

Klein: There will be multiple story paths based on how you play the game, which will result in multiple endings. Players will want to "play it again" to find new clues, meet different characters, travel to new locations, and experience very different endings.

product info

AVAILABLE: june 98
PRICE: TBA
DEVELOPER: Cortina Entertainment
PUBLISHER: Cortina Entertainment
PHONE: 213.962.2383
URL: www.cortina.com

Streets of **SimCity**

A high-speed drive through your hometown

SimCopter *had you buzzing above your own custom cityscape in search of adventure and Maxis' next* Sim *will have you racing at street level with all the action and mayhem of a high-speed car chase from hell. Hop in your hooptie and prepare to cruise your city's streets in the* Streets of SimCity.

Producer **John Csicsery** *takes* boot *on a little ride to see what's lurking 'round the corner.*

boot: Will the *Streets of SimCity* be based on the same 3D rendering engine that powered *SimCopter*? If so, what optimizations will we see in it?

Csicsery: *Streets of SimCity* uses the same engine as *SimCopter*—though we've greatly increased the resolution of the graphics. The buildings in *Streets* have been completely redesigned and their detail has been enhanced by doubling the number of polygons used to draw them. Plus, the palette has been changed to make the buildings more vibrant.

boot: *SimCopter* had a diversity of missions. What will be the goal of *Streets of SimCity*?

Csicsery: Your goal depends on which of the three play modes you choose: Sunday Driver, Racer, or Combat Courier. Sunday Driver is non-competitive. Players can take a leisurely ride through their cities. In Racer mode, your goal is to be the first across the finish line. But for the ultimate adrenaline rush, players can take part in the Combat Courier game, which sends drivers on assignments to locations throughout the city.

Players receive cash rewards based on the time it takes to complete courier missions as well as bonuses for preventing other drivers from accomplishing their jobs. Money can be spent on upgrading the player's vehicle.

Both the Racer and Combat Courier modes can be played with or without weapons and other optional equipment.

boot: How many vehicles will be available in *Streets of SimCity*?

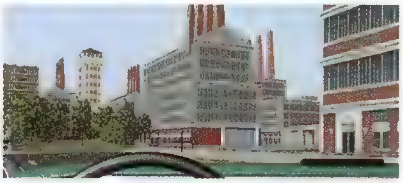
Csicsery: *Streets* will ship with five vehicles: a sedan, a race car, a utility truck, a compact car, and a '70's-era muscle car. The cars and equipment options are modular, so we can create more vehicles as add-ons later.

boot: Will *Streets of SimCity* require *SimCity 2000* or is it a free-standing program?

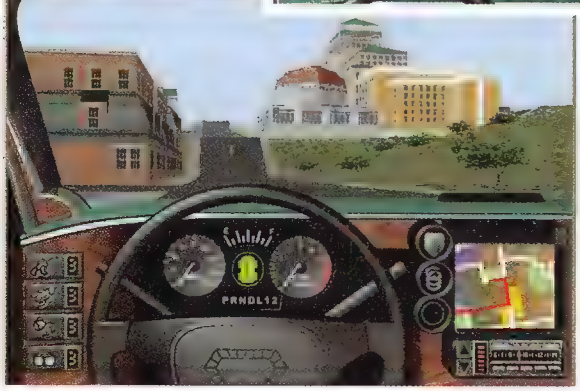
Csicsery: If you have *SimCity 2000* you'll be able to create your own custom tracks, but 50 cities will be included with the game, so you don't need *SimCity 2000* to play. And players can always download additional *SimCity 2000* cities from the Internet. One very cool feature will allow players to use the signpost feature in *SimCity 2000* to set up starting points, check points, and finish lines for the Racer mode.

boot: Are there any plans for 3D acceleration or MMX support?

Csicsery: Yes, we hope to include support for 3Dfx cards.



Cruise through the industrial side of town in the *Streets of SimCity.*



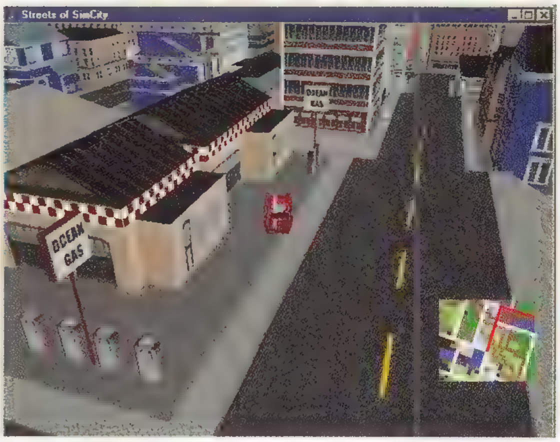
Expect to see familiar *SimCity* landmarks... only now, you're viewing them at street level.

boot: How many players will be able to play?

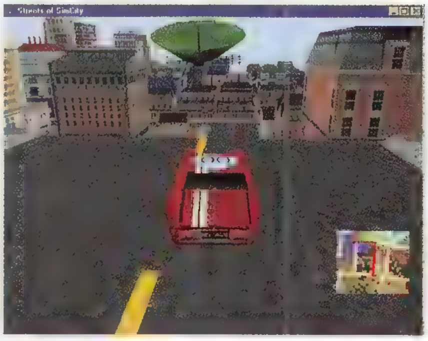
Csicsery: *Streets* supports anywhere from one to eight players and is a strong solo or multiplayer game. The Combat Courier mode is designed with deathmatch-style play in mind.

boot: How much realism will be programmed into the driving sim?

Csicsery: The car physics will be very realistic. Drive over a hill at high speed and you'll catch air. Take a corner quickly and you'll hear the tires squeal. We want the player to come away from the game feeling like they've been through a made-for-TV car chase. Now whether you're the chaser or the one being chased depends on your driving skill.



You'll be able to fill 'er up at the local gas pump in *Streets of SimCity.*



Streets of Sim City's graphics engine will sport cleaner textures and faster frame rates.

boot: How interactive will the environment be?

Csicsery: The *Streets of SimCity* are like the streets of any city. There are other vehicles on the road, pedestrians walking the streets (and dodging your approaching car), and police cars to chase down speeders. The buildings in *Streets* can even take damage and will eventually collapse from stray weapons' fire.

boot: Will there be "events"—such as the monsters or riots in *SimCity 2000*—that gamers will have to deal with?

Csicsery: We don't have monsters, but there will be other atmospheric events.

boot: Will *Streets of SimCity* integrate with *SimCopter*? Will someone be able to race in the streets while someone's up above flying in their whirlybird?

Csicsery: Integrating with *SimCity 2000* isn't enough for you? Seriously though, it's something we've thought about and it may be something we see in the future, but we're not working on it right now. With *Streets*, our focus is to make the best action driving game out there.

product info

AVAILABLE: june 97
PRICE: TBA
DEVELOPER: Maxis
PUBLISHER: Maxis
PHONE: 800.336.2947
URL: www.maxis.com

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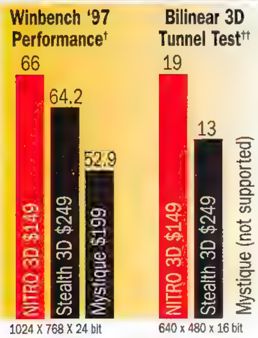

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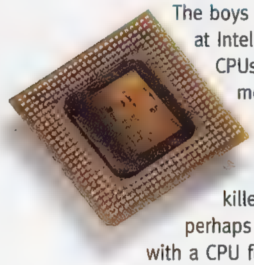
Product Information Number 307

Cyrix MediaGX

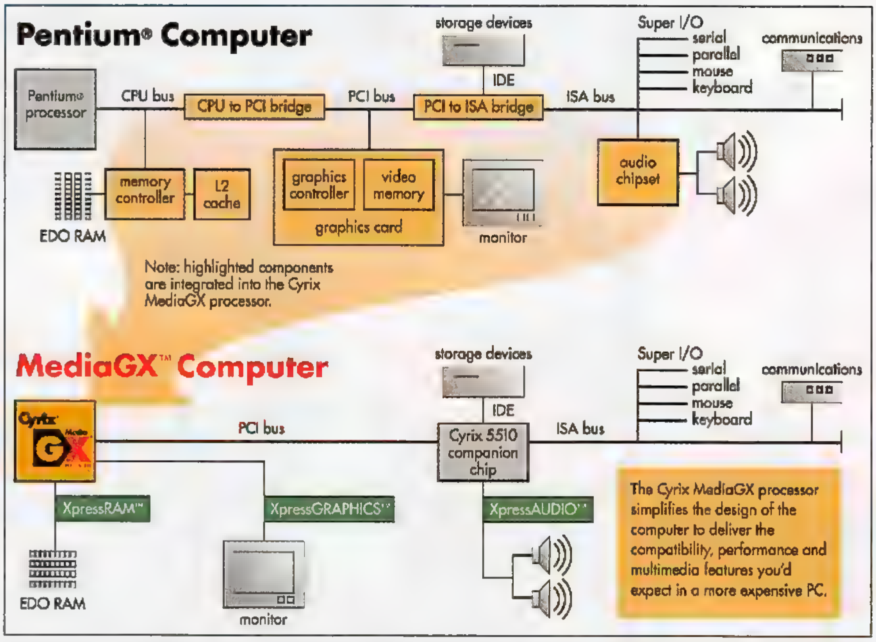
All for one and one for all



The boys in the Day-Glo zoot suits at Intel just keep making their CPUs bigger and better... and more expensive. What's a company named Cyrix to do in the wake of MMX? Design an MMX-killer called M2? Perhaps. Or perhaps Cyrix will snake Intel with a CPU for the economy PCs that are emerging to battle WebTV and capture the neophyte and technophobe markets.

That's exactly what Cyrix has done with the MediaGX. Composed of two chips, a processor, and the Cx5510 companion chip, Cyrix's new proprietary CPU hopes to give the PC that decisive edge over less robust solutions. Major players, such as Compaq and Packard Bell, are all trying to put a PC on the shelves for less than $1,000 and Cyrix hopes their MediaGX solution will take advantage of Intel's apparent snubbing of this low-end but potentially lucrative market.

With full x86 computing power, the 120MHz or 133MHz MediaGX is embellished with 16K of L1 cache, an integrated FPU processor, and a 64-bit data bus that's locked directly to the PCI bus and the EDO DRAM. Similar to Intel's 430FX PCIset, the MediaGX will max out at 128MB of system RAM. L2 cache has been abandoned altogether due to the ultra-close coupling of the memory subsystem and the CPU.


Pentium® Computer
Pentium® processor
CPU bus
CPU to PCI bridge
PCI bus
PCI to ISA bridge
storage devices
IDE
ISA bus
Super I/O
serial
parallel
mouse
keyboard
communications
EDO RAM
memory controller
L2 cache
graphics controller
video memory
graphics card
monitor
audio chipset
Note: highlighted components are integrated into the Cyrix MediaGX processor.
MediaGX™ Computer
Cyrix MediaGX
PCI bus
storage devices
IDE
Cyrix 5510 companion chip
ISA bus
Super I/O
serial
parallel
mouse
keyboard
communications
XpressRAM™
XpressGRAPHICS™
XpressAUDIO™
EDO RAM
monitor
The Cyrix MediaGX processor simplifies the design of the computer to deliver the compatibility, performance and multimedia features you'd expect in a more expensive PC.

Cyrix plans to incorporate many chip functions usually found on the motherboard directly into the heart of MediaGX.

To simplify the package (and reduce manufacturing costs) Cyrix has thrown many of the features usually found on the motherboard onto the CPU and companion chip, including the bus-mastering PCI and EIDE controller, PCI-to-ISA bridge (operating at up to 40MHz), graphics pipeline, and DRAM controller.

Will MediaGX cause a new, cost-effective multimedia revolution in the face of MMX? Cyrix hopes so.

The all-inclusive CPU even handles all the video and sound tasks normally jobbed out to peripheral cards. However, it's unclear just how copacetic this consolidated system will be when someone wants to add a 3D accelerator card or upgrade to a PCI-based sound card.

As it is now, all VGA and VESA video functions are handled within MediaGX (with a little help from their Virtual System Architecture software), providing output to an external RAMDAC for display on a CRT or flat panel. The graphics frame buffer is stored in main memory following the Unified Memory Architecture (UMA) design, but with Cyrix's new Display Compression Technology, the company claims the MediaGX will not encounter significant performance degradation. Because Cyrix will run the graphics subsystem at the CPU's core clock frequency rather than at the 33MHz limit imposed on present PCI buses, this will result in accelerated video performance... at least in theory. Graphic resolutions will range up to 1024x768 at 64k colors, and when the palette is turned down to 256 colors, resolutions of 1280x1024 are expected.

VSA and the MediaGX's Cx5510 also promise full Sound Blaster compatibility, including FM synthesis, and MPU-401 MIDI interfacing, plus the ability to upgrade to a hardware wave-table solution.

Compaq has already announced plans to support the MediaGX in their Presario 2100, and BIOS manufacturers Award and Phoenix are also announcing support for the bargain solution. All that remains to be seen is whether all those PC-less households were waiting for a cheaper PC.

— *Andrew Sanchez*

M2, Where Are You?

Visions of 64K internal L1 cache, enhanced memory management, and fully compatible MMX technology dance through your head when your hear the name. Cyrix is promising to unleash M2 in "early 1997," but Intel has already beaten them to the punch by releasing their CPUs in January 1997. While Cyrix has stated that users will simply be able to remove their current 6x86 processor and drop in M2, many motherboard manufacturers have yet to add M2 as part of their "processors supported" list in their newest 430TX PCIset systems. Only time will tell.

product info

AVAILABLE: now (to OEM); TBA (to VAR)
PRICE: TBA
COMPANY: Cyrix
PHONE: 800.777.9988
URL: www.cyrix.com

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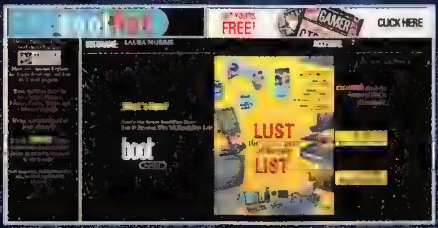
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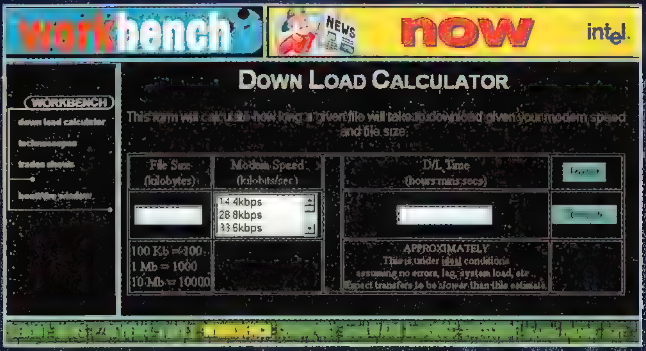
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boot reviews

KICKIN' THE TIRES ON THE LATEST **HARDWARE** AND TAKIN' THE NEWEST **SOFTWARE** OUT FOR A SPIN

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88 Toshiba **XM-3801B-S**
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90 **Bryce**2
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H/W

Micron **Millennia MXE P200** Plus

Too much power is never enough

You won't have to wait until the year 2000 to experience the next millennium. Micron's MMX-enhanced Millennia MXE P200 is here today with advanced performance in a tidy, expandable package.

Thanks to a simple, sliding side panel, the mid-size tower reveals its inner secrets. Lurking inside is Micronics' M55Hi+ ATX formfactor motherboard, bristling with 512K of L2 cache soldered directly onto the motherboard. With Intel's 430HX PCIset at the helm, you'd expect a windfall of RAM upgradability—considering the PCIset peaks at 512MB—but Micron states that 128MB is the system's maximum (for now). Still, the motherboard *is* rated to take 256MB of EDO-DRAM. Three PCI (one open), three ISA slots (one occupied), and the obligatory free shared PCI/ISA combo constitute the expansion-slot roll call. The interior sports a clean layout, with all stray cables neatly tie-wrapped and tucked away inside the empty drive bays. Headers for EIDE and floppy drives remain well out of any full-length slot's way. The necessary extra EIDE headers are provided for future expansion, as are the power cables. The unit we received for evaluation lacked USB ports, although Micronics' latest revision of the M55Hi+ (rev B7) has twin USB ports available.

The ATX motherboard keeps the P200 MMX CPU out of any full-length expansion card's way and allows Micron to utilize a freaky heat-sink design (see Dissipater sidebar). Like all well-designed ATX tower cases, fan-forced air circulation, provided by the system's power supply, keeps the CPU cool.

Riding shotgun with its 3.5-inch floppy, Micron provides an Iomega Zip drive to store all those GIFs and JPEGs. Since the drive is tied down to the system's secondary EIDE connector, only the primary slave connector is available for adding new drives, unless you go the SCSI route. The vertically mounted Western Digital Caviar 33100 3.1GB hard drive should prove spacious enough to last through the turn of the century, though.

Diamond Multimedia delivers a one-two video combination in the form of a 4MB-laden Stealth 3D 2000 *and* their 3Dfx Voodoo-based Monster 3D. All this pixel pushing is displayed on Micron's 17FGx monitor (an ADI MicroScan 5V identical to National MicroComputer's MMX offering reviewed on page 94), with refresh rates as high as a 60Hz at 1280x1024 in 64k colors.

Creative Labs' Sound Blaster 32 guarantees gaming compatibility; it's just too bad the SIMM slots on the SB32 aren't filled with 2MB of patch RAM. A pair of Advent AV270 two-way speakers handles sound reproduction. Adding a subwoofer is highly recommended, as these puppies can't dish the bass.

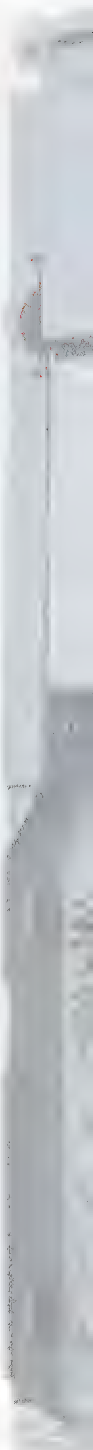
Thanks to some optimized Win95 drivers, the Millennia moved like liquid lightning in our Windows tests. Too bad the S3 ViRGE in the Stealth 3D 2000 had to muck things up by failing to provide the proper VESA 2.0 support for SVGA *Quake*. Do yourself a favor and download the latest version of *GLQuake* so you can frag in a new world of semitransparent water, reflective surfaces, and cool lighting effects that only 3Dfx offers. Also, full-screen MPEG playback suffered from serious pixelation due to a lack of vertical interpolation inherent to S3's ViRGE.

Pack-in software includes UbiSoft's *Pod* (reviewed on page 76) and a slew of video-intense titles showcasing MMX's ability to pump high color.

Micron's offering is pricier than other MMX machines, but its combination of extra performance and 3D-accelerated power make it the shape of things to come to your desktop.

— *Andrew Sanchez*

+	−
•Diamond Monster 3D (3Dfx Voodoo) •ATX formfactor design •Side panel easy to remove •Iomega Zip drive	•S3 ViRGE with no VESA 2.0 support •Poor FMV performance



under the hood

the brains

CPU	Intel Pentium 200MMX (P55C)
L2 Cache	512K pipeline burst external (soldered onto motherboard)
RAM	32MB EDO-DRAM expandable to 128MB max
Video	Diamond Stealth 3D 2000 w/4MB EDO-DRAM (S3 ViRGE); Diamond Monster 3D w/4MB EDO-DRAM (3Dfx Voodoo)

the brawn

Hard Drive	Western Digital Caviar 33100 3.1GB EIDE
CD-ROM	Teac CD-512E 12x EIDE CD-ROM
Expansion Bus	Three PCI slots (two occupied); three ISA (one occupied); one PCI/ISA shared
Fax/Modem	None

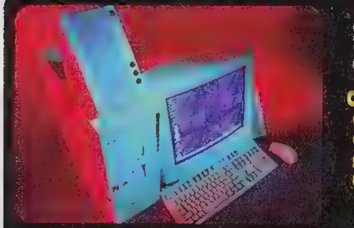
the beauty

Monitor	Micron 17FGx 0.26 dot pitch (ADI MicroScan 5V)
Sound card	Creative Labs Sound Blaster 32
Speakers	Advent AV270
Other	Iomega Zip drive

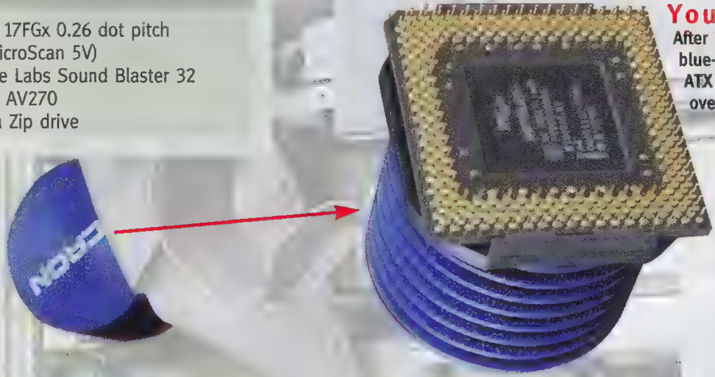
the bundle

MS Office Pro & Bookshelf • Blockbuster Entertainment Guide to Movies & Videos • Billboard Music Guide • Pod • Eraser Turnabout • Adobe PhotoDeluxe • Encarta 97 • Microsoft Money 97 • Microsoft Publisher 97 • Monster Truck Madness • Microsoft Interactive CD Sampler

the goods



Micron's Millennia MXE P200 Plus combines stellar 3D performance and robust performance with plenty of extras in an inconspicuous package.



You're Such a Dissipater

After intense thermal testing, Micron opted for this blue-anodized heat-sink structure. Thankfully, the ATX formfactor power supply keeps the air flowing over the P55C 200MHz CPU.

Soldered for All Eternity

512K of L2 cache comes standard with Micronic's M55Hi+ motherboard. The ATX formfactor ensures that you'll never butt up against your CPU when adding full-length PCI cards.

Zipping While You Work

You may find your 3.5-inch floppy drive getting a bit jealous after you've tasted what 100MB of storage can do for you.

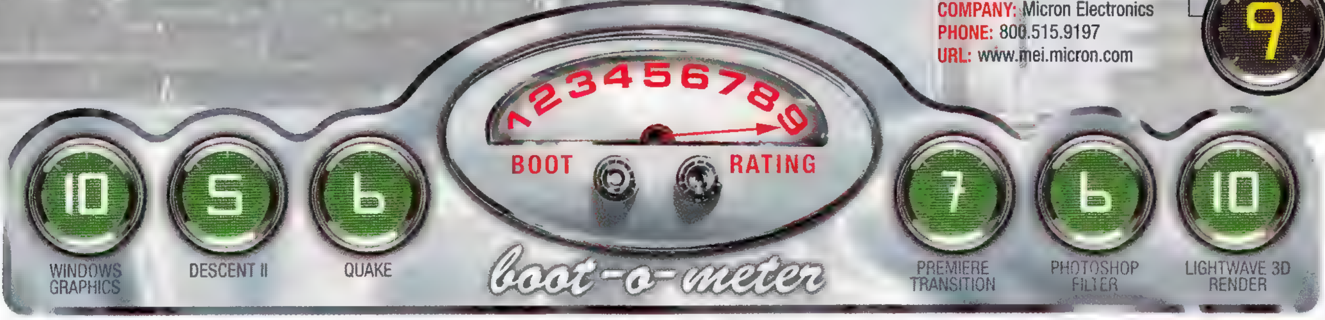
Everything Comes Up Diamonds

With Diamond's dynamic duo: the Stealth 3D 2000 and the Monster 3D, there's almost nothing they can't do... except provide VESA 2.0 support. Regardless, once you get a load of OpenGL *Quake*, you'll never look at dull, old, unaccelerated *Quake* again. You'd better keep your UniVBE handy, though.

boot verdict

PRICE: $2,999
COMPANY: Micron Electronics
PHONE: 800.515.9197
URL: www.mei.micron.com

9



A complete breakdown of benchmark results is available on the *bootNet.* Point your browser to www.bootnet.com

Generation **MMX**

Make way for the new breed of PC gaming

Promises have been made and money has changed hands. The age of MMX is upon us and now it's time to see if Intel's 57 new instruction sets can live up to their promise. The proof is, as they say, in the pudding and the pudding in this case is the software that portends to take advantage of these enhancements. Will MMX deliver the PlayStation-killing promised land of high-color, high-resolution, high frame rate games? Or will empty promises be uncovered?

— Andrew Sanchez

Sega Rally Championship

Just because its box says it "supports MMX" doesn't mean a game is optimized for the instruction set. Such is the case of this arcade-to-PC conversion.

Like its arcade sire, *Sega Rally Championship* mixes texture-mapped polygons with liberal doses of 2D sprites. And its first- or third-person perspective view can be contoured to your system's abilities. MMX isn't even required if 320x240 is all you crave, but any less horsepower will bog down 640x480 racing into slide-show city. Either resolution is available in 256 or 64k colors.

Comparisons to the arcade version (running at a solid 60fps) are inevitable—and not flattering to the PC version. On four separate P200 MMX machines, each armed with 32MB of RAM and a variety of video cards (ATI 3D Rage 2, Rendition's Vérité, and others), *Sega Rally Championship*'s 640x480 64k color mode peaks short of 15fps with minimal on-screen objects—and frame rates drop by 5fps to 10fps with multiple Gouraud-shaded vehicles and even moderate amounts of terrain. Even at 256 colors, SVGA could not break 20fps.

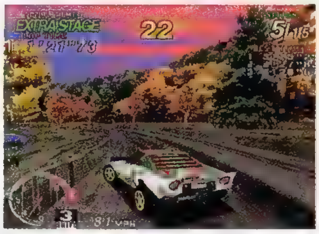
At a pixelated 320x240, the frame rate rushes by at a more natural 20fps to 25fps. Only when racing with a P-Pro 200 does the low-resolution/low-color gameplay approach the frenzied frame rates of the arcade. However, atrocious visual artifacts, such as brutal on-screen polygon redraw, texture seams, and texture warping (no perspective correction here) are glaringly evident. The pixelated texture maps will have you begging for bilinear filtering, while glass windows degenerate into checkered pixel patterns (an ugly technique used to simulate semi-transparency seen mostly in Sega Saturn games).

checklist

DirectX
DirectDraw............... ☑
Multiplayer
TCP/IP Internet .... ☑
IPX Network .... ☑

Could Sega have used MMX to enhance the windows? Yes. Could Sega have directly programmed for MMX to boost the frame rate? Yes. It seems that while *Sega Rally Championship claims* to support MMX, in reality, it will only see the standard 10 percent performance increase with MMX CPUs.

It's like saying DOS 6.22 has MMX support.

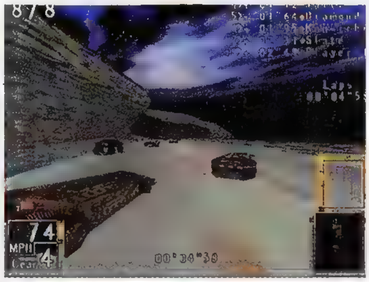


Twist and turn in *Sega Rally Championship*, but beware of its graphical glitches.

boot verdict

PRICE: $39.99
DEVELOPER: Sega Of Japan PC Division
PUBLISHER: Sega Entertainment
PHONE: 800.872.7342
URL: www.sega.com

4



Strap down and hold on tight—*Pod* brings hyperkinetic racing to your MMX PC.

Pod

Hailed as the first game to take full advantage of MMX, *Pod* is a high-speed glimpse into the instruction set's game-enhancing powers.

The Pod virus is destroying the planet and everyone's racing in souped-up hot rods to see who gets to escape (hence the name). With the plot safely out of the way, prepare yourself for whiplash-inducing mayhem.

Locked firmly in a glorious 640x480 SVGA display, *Pod*'s first- or third-person perspective texture-mapped polygons sizzle. Directional light sourcing glances off your vehicle while MMX pushes the foreboding cloud cover into new levels of detail. The skid marks you lay down as you whip about the course and the road hazards you dodge stay consistent throughout the race and highlight the detailed graphic touches, although the smoke from your tires looks distractingly unrealistic.

Tracks are made up of 64k dingy colors and vary in complexity, but low-resolution textures can degenerate into a pixelated mess at times. Terrains suffer very little from on-screen polygon redraw, but it does occur. And while support for ATI's 3D Rage and S3's ViRGE chipset come with *Pod*, no filtering is apparent. Armed with the 3Dfx-enhanced version, *Pod* blasts into a blindingly fast, bilinear-filtered rocket that jams at 60+fps. A PowerVR version is also slated for release.

If your system isn't up to snuff, graphics can be adjusted to boost frame rates.

Gameplay in *Pod* remains hyper-responsive, thanks in large part to the lightning-fast fps. Does MMX make the difference here? Yes. Hovering anywhere between 24fps and 30+fps on all of the MMX machines we tested, *Pod*'s slippery visuals go toe-to-toe with anything cranked out on a PlayStation. In racing games, frame rate makes it or breaks it, and *Pod* burns serious rubber.

checklist

3D Acceleration
3D Rage..................... ☐ ✓
3Dfx.......................... ☐ ✓
ViRGE .... ☐ ✓
PowerVR .... ☐ ✓
Multiplayer
TCP/IP Internet .... ☐ ✓
IPX Network .... ☐ ✓
3D Sound
Dolby Surround........ ☐ ✓

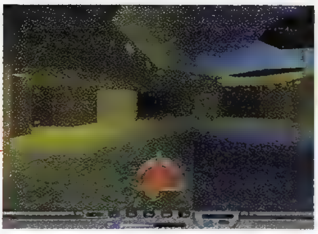
Pod's vehicles vary wildly in design and handling. If you don't like how a car feels, go ahead and tweak it.

With downloadable cars and tracks from UbiSoft's web site, as well as a host of multiplayer options (including LAN, Internet, and split screen), *Pod* shows the world what a gaming machine the MMX-enhanced PC can be.

boot verdict

PRICE: $49.95
DEVELOPER: UbiSoft Entertainment
PUBLISHER: UbiSoft
PHONE: 415.547.4000
URL: www.ubisoft.com

9



Garishly colored light sourcing awaits you in *Rebel Moon Rising*.

Rebel Moon Rising

The race to get the first MMX-enhanced first-person shooter out there before the entire world surrenders to *Unreal* has been won by Fenris Wolf. Their *Rebel Moon Rising* shows how even the best of intentions can go horribly awry.

Plot: You're yet another nameless soldier blasting everything in front of you while automated gun turrets and a bevy of misdirected humans assault you in your quest for truth, justice, and superior firepower.

Rebel Moon Rising sports a 2 ½D ray-cast, sector-based graphics engine akin to *Duke Nukem 3D.* With 64k color graphics ranging from 320x200 up to your video card's maximum resolution (including 1024x768 and beyond), frame rates are decent (in the 15fps range at 640x480), but can't compete with non-MMX-enhanced 2 ½D games such as *Redneck Rampage* at resolutions beyond that point.

Unfortunately, the 90° texture-mapped corridors of *Rebel Moon Rising* are infested with all manner of pixelated 2D sprites. And the ugly just get uglier when explosions and enemies look as if the developers were forced to work with seven frames of animation for each effect.

Rebel Moon Rising's texture-mapped realm drowns in a sea of darkened corridors bathed in colored lights... *lots* of lights. If there's an award for gratuitous use of lighting, then *Rebel Moon Rising* grabs the goat and runs away with it. Hues of greens, blues, and yellow light sourcing quickly become nauseating. Mix in your weapon's colored tracers, and it's overkill.

Despite the attempted variety of missions, including search and rescue, take and hold positions, and your standard rampaging sweeps, much of the action degenerates into finding which panel you must activate in order to open doors.

Yawn.

Everything about *Rebel Moon Rising*, from the boredom-inducing weapons to the horribly animated enemies, reeks of a substandard first-person shooter.

checklist

Multiplayer
TCP/IP Internet ....☑
IPX Network ....☑

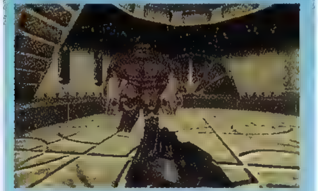
boot verdict

PRICE: TBA
DEVELOPER: Fenris Wolf
PUBLISHER: GT Interactive
PHONE: 800.469.5961
URL: www.gtinteractive.com

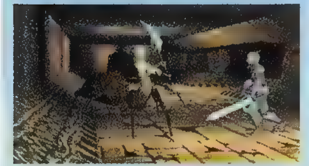
3

Waiting in the Wings

The future's so bright... you gotta wear shades! Here's the tip of the MMX gaming iceberg, and with more and more titles announcing support every day, get ready for some serious ball-busting gaming.



Unreal: The first-person shooter every *boot* Boy's salivating over. The world may never be the same after *Unreal* is unleashed upon the world. *This* could be the defining reason why MMX exists.



Dark Vengeance: Previewed in *boot* 08, Reality Bytes' *Tomb Raider* killer will push your hard-ass PC to the max. Enter their blood-soaked fantasy world... if you dare.

Other games poised to hit your MMX instruction set include Sega's arcade sensation *Virtua On*, Epic MegaGame's *Jazz Jack Rabbit 2*, and others.

Epic MegaGames: www.epicgames.com
Reality Bytes: www.realbytes.com
Sega: www.sega.com

Space Station Simulator

Space Station Simulator proves that not every MMX experience has to have guns ablazing or mechs a-marching.

Go ahead, design your own space station. And when it's ready, traverse its long, meandering corridors and explore via its 640x480 first-person perspective. MMX flexes its number-crunching power when you look about the 64k-colored pre-rendered interior, shifting the 360° QuickTime VR-like view smoothly in a way that puts *Zork Nemesis* out of a job. The on-the-fly compression is barely perceptible when you spin about, while movement is accomplished through a simple point-and-click interface. Unfortunately, *Space Station Simulator* implements a tacky bitmap scaling technique when you travel from place to place, tarnishing the rich visuals it strives so hard to convey.

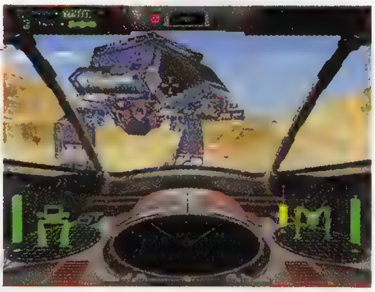
Packed with a wealth of information and tons of stunningly sharp visuals, *Space Station Simulator* soars.

boot verdict

PRICE: $49.95
DEVELOPER: Maris Multimedia
PUBLISHER: Maris Multimedia
PHONE: 800.526.2947
URL: www.maris.com

8

G-Nome



Get ready to unload your weapons at a variety of mechanized monsters in *G-Nome*.

Mechs meet MMX in 7th Level's *G-Nome*—yet another contender to the *MechWarrior 2* crown. But does "MMX support" translate into killer gameplay?

G-Nome's 640x480 256-color world springs to life thanks to a mixture of old and new technologies, with DirectDraw used exclusively for the visuals. Blocky 2D sprites are used only on certain terrain objects such as trees and the pyrotechnics that occur during fierce firefights. The variety of mechs and terrain are all texture-mapped polygons, albeit low-resolution ones.

With objects ranging in the 300 triangle count, frame rate on a P200 MMX never faltered, moving you along at some 18fps to 24fps. Firefights are viewable from a cramped first-person cockpit perspective or from a variety of third-person camera angles.

G-Nome uses MMX sparingly, with transparent bit-level transfers, shadowing, and lighting rewritten to take advantage of the new instruction set. Other than that, don't expect any cool tricks such as 64k color palettes, texture filtering, or MIP mapping.

The problem with *G-Nome* and other contenders such as *Krazy Ivan* is that these lumbering war machines move *way* too swiftly for four-story behemoth killing machines, resulting in mechs running about like frightened Chihuahuas. No sense of mass is indicated by these hyperactive speeds—it's just unrealistic.

G-Nome does bring some cool new gameplay elements, such as the ability to run around outside your mech if your Heavy Armour Weapons Chassis (HAWC) is destroyed, and even steal unoccupied mechs.

If they'd worked more on the mech movement, *G-Nome* could have been a strong contender in this hotly competitive field. Alas, its innovative gameplay is lost in a sea of cramped cockpits, pixelated textures, and spastic robots.

checklist

DirectX
DirectDraw ....☑
Multiplayer
TCP/IP Internet ....☑
IPX Network ....☑

boot verdict

PRICE: $49.99
DEVELOPER: 7th Level
PUBLISHER: 7th Level
PHONE: 800.884.8863 x5
URL: www.7thlevel.com

7

H/W

Shark 250

This tough portable drive puts the bite on storage

boot KICK ASS! PRODUCT

In a deep sea of removable hard drives, the Shark 250's unique features, capable performance, and appealing aesthetics, make this baby worth reeling in.

Unlike the Zip, Jaz, and EZFlyer drives, the Shark 250 isn't a SCSI device and doesn't require a cumbersome power supply. Instead, this fish plugs into the parallel port and draws its power from the keyboard port (both AT and PS/2 connectors are included).

Installation is quick and painless, taking only a few minutes. After you've installed the Win95 drivers, the Shark 250 will be assigned a new drive letter, and you'll be ready to roll with an extra 250MB of space. Since the drive uses an active parallel port pass-through connector, you won't have to reboot your machine to connect or disconnect it, and you can even connect your printer to the pass-through port.

The Shark 250 is a solid performer. Sustained transfer rates are slower than SCSI-based Jaz and EZFlyer drives, but considering the Shark plugs into the parallel port, the results are more than acceptable. The Shark performed even better during our file-transfer tests, posting speed increases of 10 to 20 percent over two of the magneto-optical drives reviewed in *boot* 03. It choked on our video capture tests, however, dropping almost 36 percent of the frames from a 20-second video clip.

The coolest thing about this compact drive is its lightweight design. Weighing in at less than half a pound, the Shark requires only a fraction of the desk space other drives demand. And because it doesn't need an external power adapter, it's the only drive you can use during a plane trip, a train ride, or a backyard barbecue.

The HARDiskette, which comes with its own elastomeric rubber compound, protective jacket, is comprised of stainless steel integrated into a molded plastic shell. The media itself is made from a glass substrate, providing damage protection from handling and contact with the disk heads. The diminished flexibility of the HARDiskette also makes it more resistant to hazards.

Since Avatar Peripherals claims the drive can withstand a free fall of up to three feet, we took the drive outside and dropped it, not once, not twice, but three times (from a height of 40 inches) directly onto the pavement. Much to our delight, it survived with nary an ill effect. The ABS plastic case—which popped off during the second drop test—easily snapped back into place.

The Shark 250 isn't the fastest fish in the sea, but its compact design, above-average performance, and durability, combine to create one hell of a compelling product.

— Bryan Del Rizzo

250MB
250MB

Although the Shark 250 only plugs into the parallel port, we'd love to try an IDE, SCSI, or PCMCIA version. Avatar, are you listening?

the stats

The recently released IEEE 1284 standard defines five new data-transfer modes for parallel ports, two of which—the Enhanced Parallel Port (EPP) and Extended Capability Port (ECP) modes—may boost your performance anywhere from 2x to 15x.

To work, your peripheral hardware host and operating system must support the new modes in BIOS. The Shark 250 talks directly to the parallel port chip so it always uses the highest possible setting, regardless of your current BIOS configuration.

Task	Non-EPP	EPP
Formatting 250MB disc (secs)	32	10
Opening 48MB graphic file (secs)	160	111
98MB file transfer (secs)	165	110
Average seek time	11	11

Bundle of Fun

The Shark 250 ships with one HARDiskette containing six software programs, including a shareware version of *Monster Truck Madness*, *Barking Cards* (Internet greeting cards), and *NovaDiskLite* backup utilities. All of the programs can be run from either the HARDiskette or installed on your hard drive.

If you install the whole shebang, reformat the HARDiskette to gain control of the entire 250MB.

boot verdict

PRICE: $299.99; $39 HARDiskette ($99 3-pack)
COST PER MB: $0.15
COMPANY: Avatar Peripherals Inc.
PHONE: 888.462.8282
URL: www.avatar.com

9

Takes a Lickin' and Keeps on Tickin'

The Shark 250 survived three falls onto the pavement—each from a height of 40 inches—and still worked. Now that's impressive.

BOOT EXCLUSIVE!

VideoLogic **Apocalypse 3D** rev2

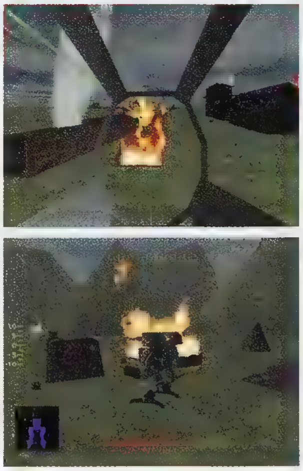
Back for the attack

boot KICK ASS! PRODUCT

Just last month *boot* reviewed the original Apocalypse 3D, concluding that "the Apocalypse 3D would have certainly been a kick-ass product if only they had gotten proper filtering in." Well, the PowerVR engineers were listening, because unlike one 3D chip maker that keeps telling us how unimportant filtering is, VideoLogic called and said, "You are absolutely right about filtering, check this out." *boot* was given an exclusive first look at the newest revision of the PowerVR chip and Apocalypse 3D board, and we have been wowed.

The original Apocalypse 3D is a PowerVR powered 3D-only accelerator that writes frames over the PCI bus into your existing 2D card's memory. It sports 4MB of SDRAM devoted to nothing but textures, and a unique architecture that eliminates the need for using a Z-buffer to calculate depth. Because it uses infinite planes rather than polygons internally, the PowerVR can perform light and shadow effects in real time that traditional 3D architectures would choke on.

The big news with the PCX2 chip is the addition of bilinear filtering for smooth textures. The chip still lacks support for the rarely used trilinear filtering, but it does introduce a new technique called adaptive bilinear filtering which can vary the degree of texture filtering based upon distance to help keep details sharp. Other new features include some geometry setup onboard (though still less setup than either 3Dfx or Rendition), better 2D/3D compositing, and a 10 percent to 15 percent overall speed improvement thanks to architectural refinements and a slightly faster clock. (For the rest of the details about the PowerVR's unique architecture, see the Apocalypse 3D review in *boot* 08.)

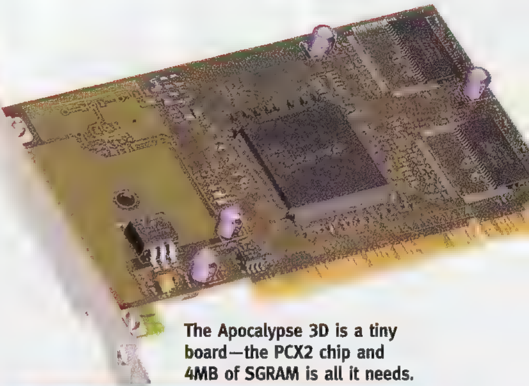


To see the huge difference filtering makes, compare the explosions from the identical *MechWarrior* binary on a PCX1 (top) and a PCX2.

The Direct3D and native-PowerSGL drivers have been enhanced to handle the new chipset features, and other than a few display glitches attributable to the beta nature of the early drivers we tested, all of our existing Direct3D and PowerVR games ran fine and fast, looking better than ever. An OpenGL driver is planned for summer (at last, *GLQuake*!), as is a DOS mode version of PowerSGL to ease 3D enhancement of DOS-only games.

The PowerVR alliance between NEC and VideoLogic is on the attack in the software arena as well. To combat 3Dfx's early lead in getting the best native content, NEC has committed $16 million dollars to help developers port to the PowerVR, and $9 million dollars in advertising and promotion. Titles on the way include *Virtua On*, *Rave Racer*, *Tekken 2*, *Wipeout XL*, and a PowerVR exclusive director's cut *of Virtua Cop 2*.

The new Apocalypse 3D shares both the name and packaging of the old version, so be sure to check closely to make sure you're getting the filtering you want and deserve. The software bundle with the rev2 card is being increased from two titles to four—the gorgeous 800x600 30fps *Ultim@te Race* will surely remain, but the other three were undecided at press time.



The Apocalypse 3D is a tiny board—the PCX2 chip and 4MB of SGRAM is all it needs.

Upgrade Your PCX

If you bought the original Apocalypse 3D card and are now dreading life in a non-filtered world, have no fear. In a rare move of corporate generosity, VideoLogic will be offering a trade-up program. Though the details weren't final at press time, the upgrade should cost around $100, and will include the new board and at least three full version PowerVR Extreme titles. *Resident Evil*, *Tomb Raider*, and *Wipeout XL* are all currently under consideration for the upgrade bundle, check VideoLogic's web site for details.

The Apocalypse 3D has gone from being a good 3D accelerator to being great, and it looks like it may at last be a match for the 3Dfx... and for only two-thirds the price! The race now is to see which platform will gather the most impressive software support. Right now the 3Dfx has a sizable head start, but PowerVR is gaining fast.

— *Chris Dunphy*

***Ultim@te Race* looks and plays better than ever with the new PowerVR chip. It's the best looking racing game we've seen.**

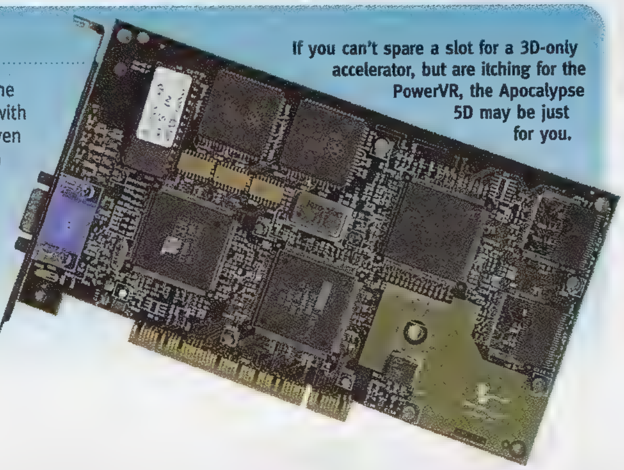
boot verdict

PRICE: $199
COMPANY: VideoLogic
PHONE: 800.578.5644
URL: www.videologic.com

9

Apocalypse 5D

The Apocalypse 5D combines the PCX2-powered Apocalypse 3D with VideoLogic's Tseng ET6000 driven GrafixStar 600 2D rocket, all on one board. There will be two models of the Apocalypse 5D released, one for $249 with 2MB of MDRAM frame buffer; another for $279 with 4MB of MDRAM. Both will also have 4MB of SGRAM texture memory to keep the PCX fed.



If you can't spare a slot for a 3D-only accelerator, but are itching for the PowerVR, the Apocalypse 5D may be just for you.

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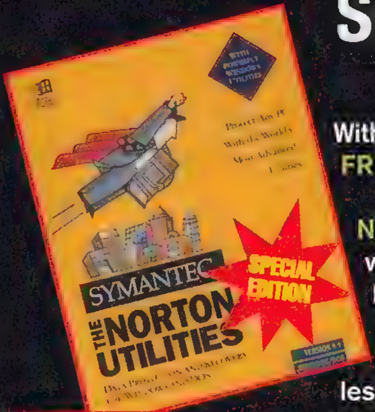
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boot

H/W

real-world battery life
02:02:00

NEC Versa **6050MX**

Triple-crown contender

With its 150MHz Pentium processor, 16MB of EDO DRAM, built-in 33.6Kbps modem, and MMX technology, you'd probably expect the Versa 6050MX to be quite the racehorse. And even though it stumbled on the way to the finish line, the Versa 6050MX manages to place.

With all that beefy MMX technology, a performance increase of 10 to 15 percent is even money. And not surprisingly, the 6050MX consistently posted above-average scores during our real-world DOS and Windows tests. The blazing 10x CD-ROM—with a transfer rate of 864K/sec—even managed to keep pace with the 2.1GB hard drive which clocked in at an extremely respectable 877K/sec. Win95 performance is stellar, and our *Premiere* and *LightWave* tests were just about off the scale.

But just as the 6050MX was on its way to the winner's circle, it lost its footing. The integrated Chips & Technologies CT65550 video chipset caused a slowdown in both Windows and DOS, and—with the chipset's quirky VESA 2.0-compliance still unresolved—quickly deflated our initial enthusiasm (see sidebar to the right). Full-screen MPEG playback was extremely choppy, and although screen redraw is relatively quick, the color quality just isn't up to snuff. For speed, full-screen playback maxed out at a disappointing 8fps to 10fps. We were also disappointed with the 6050MX's inability to handle DOS games—when we attempted to install *Quake*, the 6050MX crashed about 20 percent of the time. A system BIOS upgrade fixes the problem, so make sure you have the latest revision. Thankfully, NEC provides BIOS upgrades for free. (At press time, the latest version was number 40.)

The 12.1-inch active-matrix screen is bright and beautiful, especially when combined with a robust 1024x768, 16-bit color display. When pressed, the display exhibits virtually no flex, and folds completely flat for attaching an external CRT. The Altec Lansing stereo speakers are positioned in the bottom corners of the display, and do an adequate job of pushing audio. NEC also scores a hat-trick with their decision to integrate a brightness slider, volume control, (and get this) dual IrDA ports, one located on the front and one located at the back, along with the usual serial, PS/2, docking station, and parallel ports. The integrated Vibra 16 audio chip delivers uninspired but Sound Blaster 16-compatible FM-synth sound. About the only thing missing is a PC game port.

Battery life was solid—we managed to squeak out just over two hours from a fully charged battery. If you're hankering for more zest, the interchangeable CD-ROM and floppy drives can be swapped out to add an additional lithium-ion battery or hard drive.

The Versa 6050MX has some exceptional features, and overall, this MMX-fueled steed is fast out of the gate. If only we could shoot the pesky Chips & Technologies CT65550 chipset that hobbles this contender.

—Bryan Del Rizzo

The CT65550: The Chip From Hell?

Last month we detailed a problem we encountered with Hitachi's Mx-133T notebook, which incorporated Chips & Technologies' CT65550 graphic chipset. Resolutions higher than 360x480 turned the screen a weird shade of blue and green in *Quake*, making gameplay virtually impossible. Neither Hitachi nor C&T was able to offer a solution, although C&T did surmise the problem may have something to do with a faulty VESA 2.0 specification.

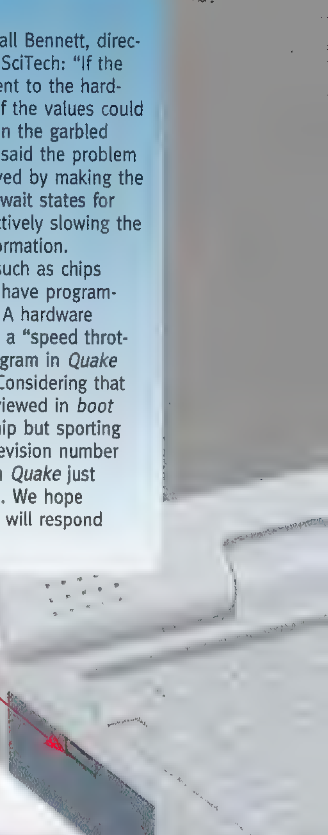
Since the Versa 6050MX uses exactly the same chipset, we weren't surprised to see the same blue-and-green screen appear when we ran *Quake*. As expected, NEC weren't able to offer a solution. Tired of the finger-pointing from C&T, NEC, and Hitachi, we turned to SciTech Software and id Software for possible theories. Both of these companies think the problem lies in hardware, and not necessarily the game software.

According to Kendall Bennett, director of engineering for SciTech: "If the palette values were sent to the hardware too fast, many of the values could get missed, resulting in the garbled screen." Bennett also said the problem could possibly be solved by making the hardware insert more wait states for palette accesses, effectively slowing the transfer of palette information.

Some PCI chips—such as chips from 3Dlabs—already have programmable values for this. A hardware BIOS upgrade or even a "speed throttle" of the palette program in *Quake* may be the solution. Considering that a Fujitsu Lifebook (reviewed in *boot* 07) using the same chip but sporting a different hardware revision number and software drive ran *Quake* just fine, this makes sense. We hope NEC, Hitachi, and C&T will respond accordingly.

LATE BREAKING UPDATE

Just as we were going to press, NEC provided a new video BIOS that corrects the *Quake* problem. The self-executing file is located on the *bootDisc* in the NECBIOS directory. Clicking on the file will automatically install the drivers by preparing a bootable floppy which can then be used to upgrade the video BIOS.

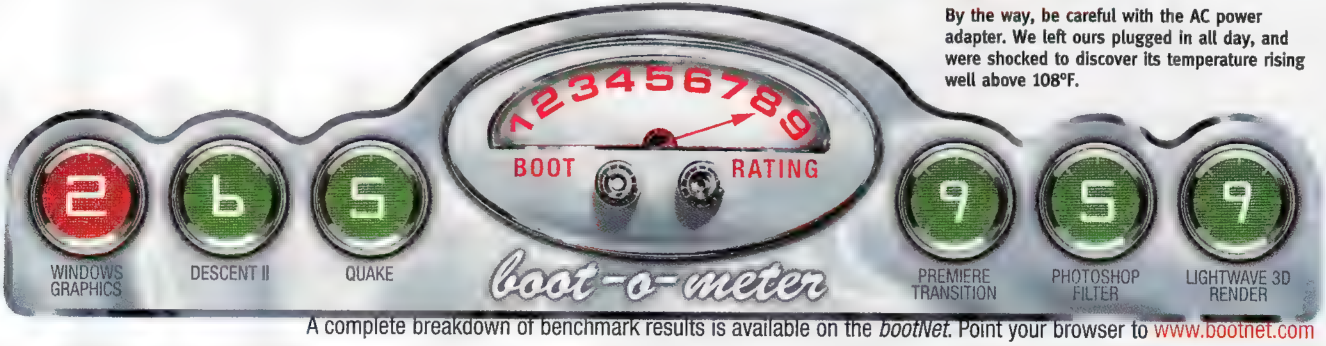


Zoom In, Zoom Out

The two PCMCIA expansion slots are compatible with Zoomed Video and CardBus technologies.

Hot Brick

By the way, be careful with the AC power adapter. We left ours plugged in all day, and were shocked to discover its temperature rising well above 108°F.



A complete breakdown of benchmark results is available on the *bootNet*. Point your browser to www.bootnet.com

under the hood

the brains

CPU	150MHz Intel Pentium with MMX
L2 Cache	256K
RAM	16MB (80MB max)
Video	Chips & Technologies CT65550 (2MB EDO VRAM)

the brawn

Hard Drive	Toshiba 2.1GB
CD-ROM	Toshiba 10x
Expansion Bus	Two Type II cards or one Type III PCMCIA card
Lap Weight	7 pounds, 7 ounces
Carrying Weight	8 pounds, 14 ounces

the beauty

Display	12.1-inch active matrix
Sound	Creative Labs Vibra 16
Video	1024x768, 16-bit color
Speakers	Altec Lansing stereo speakers
Communication	33.6Kbps modem; dual infrared ports

the bundle

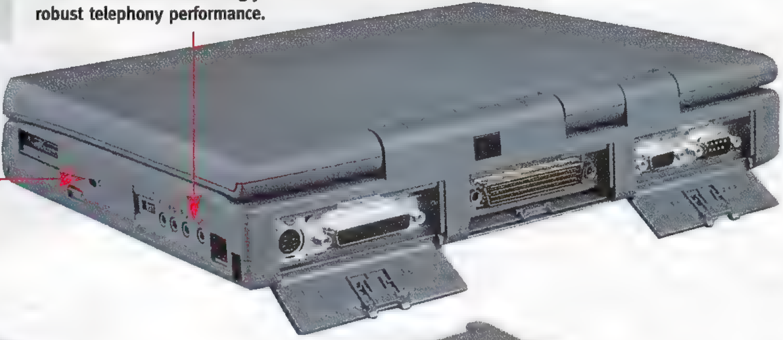
FaxWorks • LapLink for Win95 • MMX Enhanced Star Trek First Contact VideoSaver CD • McAfee Virus Scan and Web Scan • Netscape Navigator • Official Airline Guide • Xing MPEG player

the goods

The Versa 6050MX is a mixed bag. The MMX-enhanced performance is welcome, but thudding video performance during full-screen MPEG playback and lack of proper VESA compliance leave a bitter aftertaste.

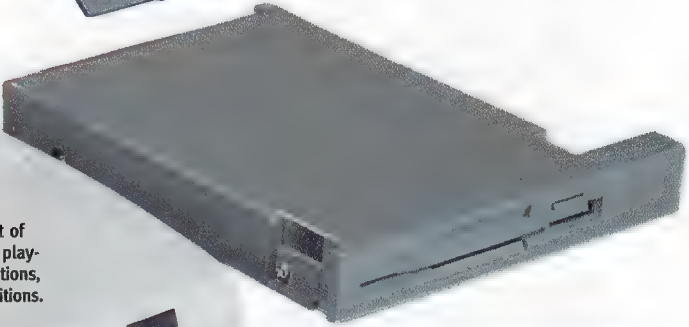
Hear Ye, Hear Ye

Now this we like—an analog volume control. The separate microphone, line-in, line-out, and headphone jacks are also nice accouterments. The built-in 33.6Kbps data/fax/voice modem includes a connector for plugging in a cell phone, and the built-in microphone (which doubles as a speakerphone)—combined with excellent communication software—results in resoundingly robust telephony performance.



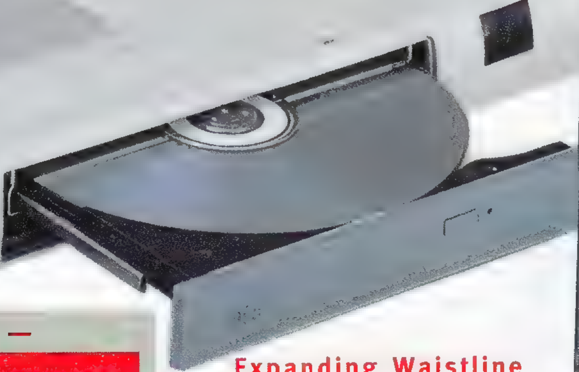
Lock Around the Clock

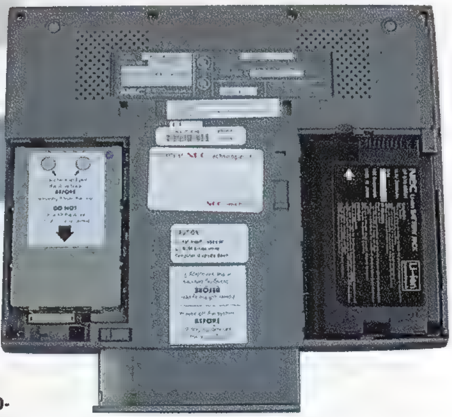
If you're concerned about protection and security, the Versa 6050MX includes a Kensington lock socket so you can attach a special lock and 6-foot steel cable (which can be wrapped around the bedpost in a hotel room, through the handle of a desk drawer, or even around the leg of a co-worker). Lock and cable not included.



No Keycard Required

The keyboard has a great feel—the keys hug your fingertips with just the right amount of bounce and response. But where's the Windows key? (Good news for *Duke Nukem 3D* players.) The VersaGlide touchpad responds well and comes with a bevy of customizing options, including shortcut assignments, motion sensitivity, precision settings, and pointer definitions.





Expanding Waistline

The Versa 6050MX is equipped with a "VersaBay II," a fancy way of informing you that you can swap out the floppy drive or CD-ROM drive and replace them with an additional lithium-ion battery or optional hard drive.

+

- 150MHz Pentium Processor with MMX
- 1024x768 screen resolution
- Zoomed Video Port
- CardBus Compatible
- Dual IrDA ports
- Built-in 33.6Kbps modem
- Analog volume and brightness controls

−

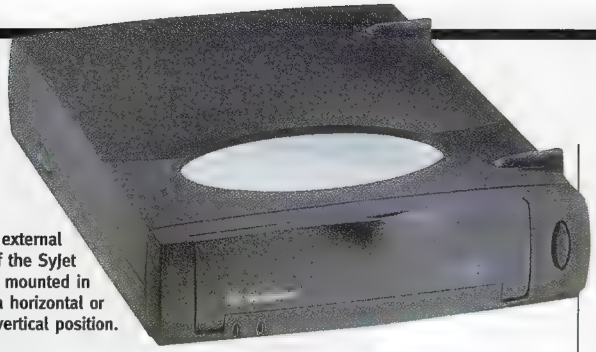
- CT65550 graphics chip
- Mediocre full-screen MPEG playback
- FM-synth sound
- Only one PS/2 connector
- No game port
- No MMX games included

boot verdict

PRICE: $5,199
COMPANY: NEC
PHONE: 800.632.4636
URL: www.nec.com

8

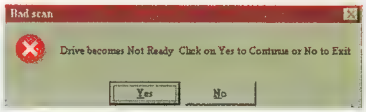
H/W



The external version of the SyJet can be mounted in a horizontal or vertical position.

SyQuest **SyJet**

Clear the runway



Drive becomes Not Ready Click on Yes to Continue or No to Exit

SyJet's utility software feels like it was hastily put together, and nonsensical error messages are common.

Announced more than a year ago, the SyJet quickly assumed the same apocryphal status as the B-1 Stealth Bomber—seldom heard or seen, except for related wreckage found in the New Mexico desert. It was headed for a big dogfight with Iomega's Jaz drive, which beat it to market in June '96 and quickly took off as the high-capacity removable media drive of choice. Both drives are SCSI II devices (SyJet has an EIDE version scheduled for release in June), but the SyJet has the capacity edge at 1.5GB vs. the Jaz drive's 1GB. So, is the SyJet in for smooth sailing?

Not if you happen to interrupt the SyJet's formatting process. While formatting our first cartridge, canceling the error-checking process rendered the cartridge unusable. Considering that the drive ships with only one cartridge, this left us in a pretty sad state. SyQuest's tech support declared the cause of death to be an irreparably corrupted master boot record. SyJet cartridges are under life-time warranty (and well they should be), so a new one is on the way from customer service. Still, a quick trip to the computer store was necessary, and $124.95 got us back on track with a new cartridge.

It only took 25 seconds to format the new cartridge, but the prep software which scans for bad sectors required 18 minutes more (you can see why we interrupted it). Opening a 50MB CMYK image in *Photoshop* took 1 minute and 35 seconds. Moving 109MB of data to the SyJet took 2 minutes, and moving it back required a ripping 51 seconds. When capturing 20 seconds of video at 30fps directly to the SyJet, it dropped 5 frames. All this puts the SyJet on par with the Jaz, but the SyJet performs better when working with larger file sizes.

Dare to Compare
Iomega Jaz vs. SyQuest SyJet

	JAZ	SYJET
Capacity	1.5GB	1.0GB
Price of Drive	$499	$499.95
Price of Cartridge	$124.95	$99
Price per MB	8¢	10¢
PERFORMANCE TESTS		
Photoshop	1 min, 35 secs	1 min, 31 secs
Copy To	2 mins	2 mins, 23 secs
Copy From	51 secs	50 secs
Video Capture	dropped 5 frames	dropped 6 frames

If your needs fall beyond the 1GB limit of Jaz, consider a SyJet. If a gig's plenty, the Jaz drive is still the only way to fly.

—Sean Downey

boot verdict

PRICE: internal $399; external $499
COMPANY: SyQuest
PHONE: 800.245.2278
URL: www.syquest.com

6

Sejin **SPR-8696WT** FreeBoard

It's wirelessly delicious

Whether earthbound or sitting on your lap 15 feet away, the Sejin SPR-8696WT gets you into the realm of wireless keyboards.

Surf or frag from long distances with Sejin's SPR-8696WT wireless keyboard. The keyboard combines a 3/4-inch miniature trackball and 86 full-sized keys within a tiny 11.5 x 6.2 x 1-inch footprint, and provides an infrared link that will have you computing without a leash in no time.

Designed with remote hand-holding in mind, the PC/AT-function keyboard also sports two mouse buttons which reside in the upper corners of the membrane-switched keyboard.

The IR receiver bridging the communication barrier terminates in two PS/2 connectors, and placement of the receiver is paramount. Placing the unit on top of your monitor will interrupt the line of sight and disable the keyboard. Table-top positioning is best, with maximum range petering out at 15 feet.

While a PS/2-AT DIN keyboard adapter is included, the trackball only works as a PS/2 device! If your system isn't properly endowed, don't even think about a PS/2-to-9 pin adapter. It will only put the keyboard and serial port in mortal danger.

Otherwise, the SPR-8696WT performs with nary a hitch, and no special software drivers are required. But you may have to re-tool your typing habits a bit, because certain keys—such as DEL and INST—have moved to accommodate the smaller footprint. Also, the thinned-down arrow keys may have pudgy fingered keyboard pugilists squirming for proper placement.

Overall, the Sejin SPR-8696WT is a solid performer for those who need to roam free. Now, if only they'd unleash the trackball from its PS/2 confines...

— Andrew Sanchez

boot verdict

PRICE: $99
COMPANY: Sejin America Inc.
PHONE: 888.373.3273
URL: www.sejin.com

7

H/W

AWE64 Gold

So near, yet so far

Serious PC audiophiles have been held hostage for years by a multitude of lousy FM and wavetable synthesis audio cards, but the AWE64 Gold is the first consumer-grade sound card with the key features to set them free.

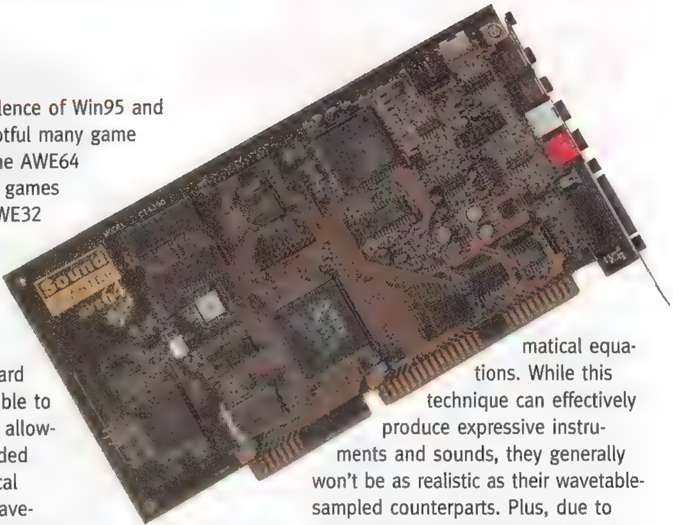
And before you ask... No, the AWE64 Gold isn't a 64-bit sound card. The 64 in the name refers to the polyphony—32 voices via the hardware EMU8000 wavetable synthesizer plus an additional 32 voices via WaveSynth, a software-based wavetable engine using Sondius' WaveGuide technology. Or, if you fancy aural torture, you can use the raspy, four-operator, 11-voice FM synth (or the two-operator, 20-voice FM synth) included for backward Sound Blaster compatibility. In Win95, each synth engine is addressable—with its own particular flavor of sound—and can be accessed on the fly during playback.

Still, while this may seem impressive, more than 32 voices of polyphony are rarely required for a given song, unless you're recreating a symphony instrument for instrument. And even then, most musicians wouldn't ask for 32 voices from a single synthesizer.

Unfortunately, the AWE64 Gold isn't radically different from its predecessor, the AWE32. Both cards use the same EMU8000 synth engine and both contain exactly the same 1MB ROM patch set. A beefier 2MB or 4MB ROM set would have been sweet. Still, the AWE64 Gold is quieter, thanks to a new hardware design (see sidebar), but you won't necessarily be listening to games any differently. The prevalence of Win95 and DirectSound make it doubtful many game developers will support the AWE64 Gold directly; and in DOS games you'll end up choosing AWE32 or Sound Blaster 16 from the setup menus.

Both the AWE64 Gold and the AWE32 support downloadable SoundFont technology (4MB of onboard RAM is included, expandable to 28MB via daughtercards), allowing you to play any recorded sound in place of a musical instrument through the wavetable synthesizer. You can record your own samples and specify more than 40 processing parameters. This is a novel idea, but it isn't new; the original Gravis UltraSound cards offered a similar feature way back in 1992. The SoundFont architecture allows you to replace any of the sounds included with a game, but only in rare games where SoundFonts are directly supported.

Based on Sondius' WaveGuide technology, the software-based WaveSynth can personalize various MIDI instruments. Using acoustic physical modeling, a mathematical model of the instrument is created, with each piece of the instrument represented by a series of mathematical equations. While this technique can effectively produce expressive instruments and sounds, they generally won't be as realistic as their wavetable-sampled counterparts. Plus, due to the intensive computations, the software-based WaveSynth can cripple your CPU. About 10 to 15 percent of the CPU is used if a moderately complicated MIDI file is played.



The AWE64 Gold has some anomalies—you can't record MIDI playback through the software WaveSynth, and in full-duplex mode you can only play and record uncompressed (PCM) WAV files.

Playing MIDI files (from *Ultima 8*) on both synth engines and a Gravis UltraSound PnP Pro did reveal differences. While both cards' drums and trumpets sounded good, the EMU8000 synth sounded much more realistic overall—with more depth, punch, full string and synth-pads—than either the software WaveSynth or UltraSound card. In fact, the CPU-intensive WaveSynth generated sounds that consistently posted at the bottom of our listening tests. The upright bass and music-box patches on the EMU8000 synth sounded great, but the violins didn't roll and sounded artificial, chorus samples were substandard, and the electric guitar patches, in particular, were disappointingly weak.

Bundled with the AWE64 Gold is an array of software including *WebPhone*, *Real Audio Player*, *Vienna SoundFont v2.0 Studio*, Voyetra's *MIDI Orchestrator Plus*, and two full games—*Eradicator* and *Magic Carpet 2* (with a built-in SoundFont library).

Overall, the AWE64 is an affordable solution that will enhance any musician's home studio. But as a replacement for a real synthesizer or professional high-end sound card, the AWE64 Gold may leave you wanting a little more.

— Bryan Del Rizzo

AWE32/AWE64 Gold: Can You Tell the Difference?

Aside from the WaveSynth engine (which is offered as a software upgrade to AWE32 owners), the AWE64 Gold's biggest distinction is in its hardware.

First off, the AWE64 is half the size of the AWE32. To reduce bus buzz Creative Labs completely integrated the EMU8000 wavetable synthesizer, along with the mixer, DAC, and Vibra 16 chip (FM synthesizer) into one huge core logic chipset. This design overhaul, coupled with the addition of a 20-bit S/PDIF (Sony/Philips Digital Interface) chip, has resulted in a much quieter card. During our tests, the frequency response graph appeared fairly flat with a slight wobble around the 8kHz range, but with proper gain adjustments on the mixing board, the AWE64 is the quietest card we've heard.

Creative also wisely dumped the IDE connector and amplified line-out and replaced them with gold-plated RCA analog outputs and a 20-bit coaxial S/PDIF output on a separate bracket. While the S/PDIF lets you digitally dump your compositions to DAT, you can't record WAV files that aren't sampled at 44.1kHz in 16-bit stereo, nor can you copy a compact disc track. Positioning the S/PDIF before the DAC and inserting a sample-rate converter so that any output could be recorded digitally would have fixed that.

Instead of the ⅛-inch microphone input, split RCA line inputs would have been better; and to facilitate hooking up real multimedia speakers, the male ⅛-inch jack on the supplied male RCA to ⅛-inch Y-cable should have been female. A digital input would have been appreciated as well, and even though the gold plating looks impressive, mixing metal types on plugs is never a good idea.

Also, unlike the AWE32, the AWE64 Gold offers full-duplexing capability with support for recording and playing 16-bit samples simultaneously, with selectable sampling rates from 5kHz to 44.1kHz.

boot verdict

PRICE: $249.99
COMPANY: Creative Labs
PHONE: 800.998.5227
URL: www.creativelabs.com

7

real-world battery life

01:35:18

Compaq Presario 1080 MMX

Darn slick

Until recently, most notebooks were designed for corporate road warriors using them for word processing, spreadsheets, e-mail, and doing nifty *PowerPoint* presentations... with an occasional game of *Klondike* thrown in. Multimedia options are plentiful but expensive and often poorly implemented. Most notebooks are just a lot of stuff crammed into a tiny space, with little thought toward making a well-rounded system that an average Joe might want to use. This is why Compaq's Presario line of notebooks is so refreshing. Here we have excellent, well-rounded systems that also just happen to fit on your lap.

The case of the 1080 is a marvel of intelligent design and simplicity. The 10x CD-ROM and floppy drive are smartly integrated into the side, so there's no need to juggle two devices in one bay as there is with so many other notebooks. All the ports and slots you could want are readily available along the right side and across the back, including handy touches such as a full-sized game port and a connection for hooking up to an optional port replicator.

The 1080's graphics system is both a strength and one of the Compaq's most significant weaknesses. The NeoMagic graphics chipset is among the fastest we've seen in a notebook, and it even works well in most VESA 2.0 modes. *Quake* is actually playable at 800x600! But the 1080's meager 1MB of memory limits usable display modes to 800x600 with 16-bit color on the LCD, and a max of 1024x768 with 256 colors on an external display. The LCD is also a mixed blessing. Every screen mode fills the entire screen, rather than running centered with a beefy black border as is the case with most other notebooks. The colors are vibrant and the display is very bright, but only when viewed dead on. Moving your head just a little off-axis can result in wild changes in contrast across the screen.

The excellent sound-output capabilities of the 1080 make it almost possible to overlook its lack of wavetable sound. Rather than tinny FM-synth crap, the luscious integrated speakers project full, rich FM-synth crap. With the power of MMX onboard, however, you should soon be able to buy third-party, software-based MIDI synths that do justice to these great speakers.

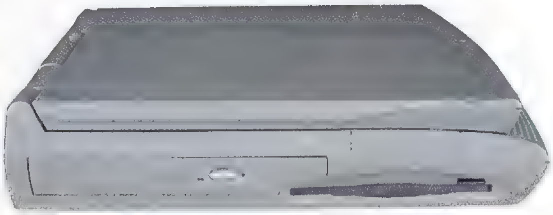
All is not totally roses with the Presario 1080, though. When you first turn it on, it requests 31 blank floppy disks for backing up Windows. Compaq neglected to include a Win95 CD-ROM! And while the 10x CD-ROM drive is faster than the drive in most notebooks, it performs more like a 6x than a 10x. Also, the inability to expand RAM beyond 48MB may limit your options. Performance is zippy for the most part, but the machine bogs down when things get complicated, which is probably due in part to having only 16MB onboard. RAM is cheap; Compaq should have included the emerging standard 32MB. Playing the only included MMX game, *Pod*, also showed a bit of display choppiness. Still very playable, but disappointing.

You'll pay a premium to get the power of MMX on your lap now, but prices will drop fast—Compaq sells the similarly equipped 133MHz Presario 1030 (reviewed in *boot* 07) for only $3,799. Even so, the Presario 1080 is an excellent notebook that feels right at home *at* home, not just in a corporate weenie's briefcase. No matter what the price, you'll be very pleased with this mobile megamachine.

— Chris Dunphy

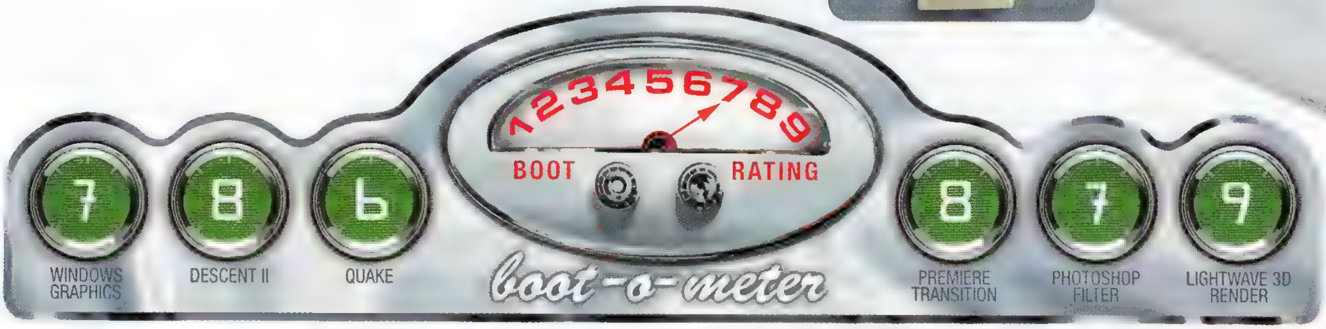
Ports Galore

Unlike many notebooks, the 1080 features a full-size MIDI/game port, no need for a special adapter cable to plug in your favorite game pad. The rest of the back panel is pretty standard: PS/2 keyboard/mouse port, VGA-out, serial port, parallel port, power jack, and a connector for a docking station. The modem's phone jacks and the PCMCIA slots, as well as a volume control wheel and audio in/out, are on the side.



Charge Me Up

An internal AC adapter would have been nice, but this external box is small and light enough (1 pound, 2 ounces) to not cause too much hassle.



A complete breakdown of benchmark results is available on the *bootNet.* Point your browser to www.bootnet.com

under the hood

the brains

CPU......................166MHz Intel Pentium with MMX
L2 Cache..............256K pipeline burst
RAM......................16MB EDO DRAM (48MB max)
Video...................NeoMagic MagicGraph 128ZV (1MB EDO DRAM)

the brawn

Hard Drive............1.4GB
CD-ROM................Toshiba 10x
Expansion Bus .....Two Type II or one Type III PCMCIA slot, Zoomed Video enabled
Lap Weight...........7 pounds, 6 ounces
Carrying Weight....8 pounds, 8 ounces

the beauty

Display..................12.1-inch TFT screen (800x600x16-bit color)
Sound...................ESS AudioDrive FM Synth; 16-bit stereo audio in/out
Speakers ....2w stereo speakers; headphone, line-out, and mic ports
Other.......................Microphone built into lid casing; Synaptics TouchPad
Communications...Compaq Presario 336-VSC 33.6Kbps modem

the bundle

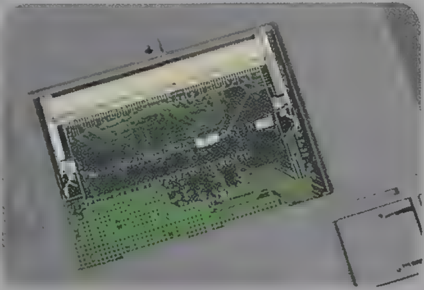
Compaq Phone Center (fax, speakerphone, voicemail) • MegaPhone (30-day trial version) • AOL • Netscape Navigator 3.0 • Full Tilt! Pinball Demo • Microsoft Works 4.0 • Quicken SE • LapLink • Compton's Reference Collection • Pod (MMX) • Ultimate Human Body (MMX)

the goods

The Presario 1080 is a looker no matter how you size it up. Excellent performance and lots of polish make this a notebook that really can serve as a desktop replacement for those who use their notebook for more than just word processing.

Bottoms Up

A bottom panel unscrews to reveal a SODIMM socket that can accept an additional 32MB of RAM.

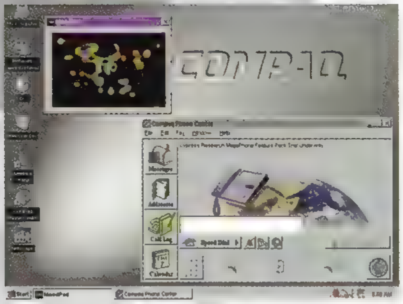


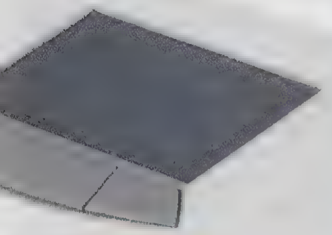
Battery Life Blues

The 1080 gets just over an hour and a half of battery life when in heavy use, an hour less than its predecessor, the 1030! Windows can't read the battery level, either, so the only indication that your time is limited is a slight change in the status screen when you're down to 10 minutes remaining. There are two power-saving modes: Sleep lets your computer idle for up to 24 hours, while Hibernation freezes the current state to the hard drive. But since it takes a long 10 seconds to recover from a Sleep and only 15 to awaken from a Hibernation, why use Sleep?

Go Hands-Free

The Compaq Phone Center lets you use the 1080 as a full-duplex speakerphone, voicemail system, and fax. Meanwhile, the MoodPad toy turns the touchpad into a psychedelic experience.





Touch Me, Feel Me

The Synaptics TouchPad takes fingertip control to new heights. The innovative driver software can scroll most windows up and down effortlessly with just finger pressure controlling scroll speed. Other features include three-button mouse emulation.

Pump Up the Volume

It wouldn't be hard to mistake this pizza-box Presario line for boomboxes. The CD-ROM drive controls and speakers are mounted on the front so that they're functional even when the case is closed. The little nostrils under the CD controls aren't just for looks, but are ports for the bass chambers of the powerful little 2-watt speakers. The 1080 may not have a subwoofer, but this is the first notebook that actually lets you feel the bass.

+

- MMX TO GO
- EXCELLENT CPU AND GRAPHICS PERFORMANCE
- GREAT SPEAKERS
- INTEGRATED CD-ROM AND FLOPPY DRIVES
- FULL-SIZE GAME PORT
- SOLID CASE, POLISHED ENGINEERING
- FEATURE-RICH, EASY-TO-USE TOUCHPAD
- ALL RESOLUTIONS FILL THE FULL LCD
- GOOD VIDEO PLAYBACK EVEN FULL-SCREEN

−

- NO IRDA PORT
- ASKS FOR 31 FLOPPIES TO BACK UP SYSTEM SOFTWARE!
- MAX 800X600 RESOLUTION
- SLOW CD-ROM DRIVE
- NO WAY TO GAUGE BATTERY LIFE
- SLOW WAKE-UPS WHEN ASLEEP
- POOR OFF-AXIS VIEWING
- LIMITED RAM EXPANSION
- NO WAVETABLE SOUND

boot verdict

9

PRICE: $4,499
COMPANY: Compaq
PHONE: 800.345.1518
URL: www.compaq.com

The SCSI/IDE Dilemna

Speedy new IDE CD-ROM attempts to break the SCSI sound barrier

It used to be that if you wanted a high-performance CD-ROM drive, you bought SCSI. Let's face it, IDE CD-ROM drives are slow and downright unreliable. But going SCSI isn't the easiest solution either. It requires a physical card, which in turn costs you a slot in your computer, not to mention the extra configuration time and money. Ultimately, a good SCSI card costs more than the CD-ROM drive itself. However, the walls of distinction are crumbling, and unless you already own a SCSI card, you may just want to take a second look at these speedy IDE CD-ROM drives. Not only are they cheaper, but the latest technological breakthroughs make them a contender.

— Sean Cleveland

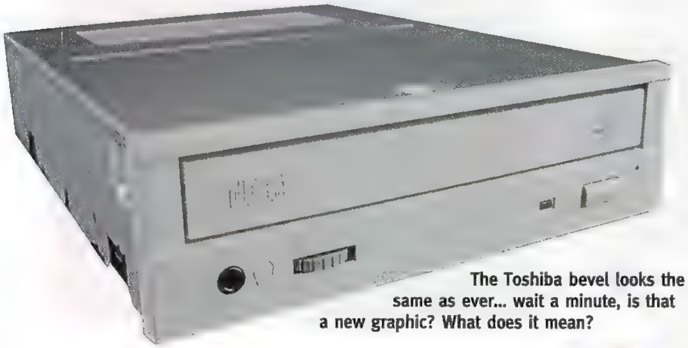
Toshiba XM-3801B-S 15X SCSI

The XM-3801B-S is the latest creation from the venerable Toshiba. Equipped with a 256K buffer, its architecture is based on Partial Constant Angular Velocity, a technology that combines features of Constant Linear Velocity (CLV) and Constant Angular Velocity (CAV). The technology gives this drive a fast seek time and high throughput. With a 90ms average seek time, an average data-transfer rate of 2565K/sec, and synchronous burst rates up to 10MB/sec, one would think there was magic in here.

There isn't.

The benchmarks reveal the truth: This drive performs closer to a 13x drive overall, delivering a sustained throughput a full 20 percent slower than spec'd. It did perform very well in our real-world tests, though. Copying the *Wing Commander IV* files (579MB) to the hard drive in a very decent 280 seconds. The intro played smoothly as well with no frames dropped, while the first mission loaded in 5 seconds.

The XM-3801B-S comes equipped with variable-gain circuitry and is multi-read capable; meaning it's compatible with CD-Rewritable media, which has lower reflectivity than other CD-ROM discs. It has MPC III compatibility built-in, along with multisession PhotoCD support (PhotoCD, CD EXTRA, CD-RW).



The Toshiba bevel looks the same as ever... wait a minute, is that a new graphic? What does it mean?

boot verdict

7

PRICE: $290
COMPANY: Toshiba
PHONE: 714.457.0777
URL: www.toshiba.com

Wearnes drives use loading tray systems and sport a play button—very handy when you want quick music without the hassle of firing up software.

Wearnes CDD-1620 16x E-IDE

Fast on the heels of Toshiba is Wearnes, who manufacture only IDE CD-ROM drives. Their newest offering uses VCL, a mix of CAV and CLV that improves access time and reduces mechanical noise.

The specs for this drive are right on the money, even conservative in comparison to our benchmark results. The CDD-1620 is a solid 16x performer, streaming 2.5MB/sec! Wearnes specifications for the drive show an average access time of less than 130ms. Our random seek results show it closer to 120ms. This figure dropped dramatically under OSR/2 with bus mastering E-IDE DMA turned on, coming in at 97ms, just 5ms shy of the Toshiba drive!

CPU utilization was nearly double that of the Toshiba drive, yet still very good when compared to other IDE drives. SCSI host adapters take charge of a drive when it's in use, alleviating the CPU from a lot of extra work.

The CDD-1620 couldn't keep up in our burst-rate speed test, however, maxing out at 2.7MB per second, far short of the awesome figure attained by Toshiba's XM-3801B-S.

The real-world tests couldn't compare to the Toshiba drive either. The *WCIV* files took a full 378 seconds to copy, a damn fine example of how important high burst rate can be. The intro to *WCIV* played smoothly except for one skip and the CDD-1620 took 5.5 seconds to load the first mission. Other things we found lacking were the 128K buffer and a poorly manufactured drive tray that was not only flimsy but had a tendency to stick.

The CDD-1620 shows a lot of promise. It proves that IDE drives of this caliber deserve to be taken seriously when compared to their SCSI counterparts, especially when considering the significant price difference. Not only is this drive $140 cheaper than the comparable Toshiba, it doesn't require a SCSI host adapter either, which could set you back an additional $100.

under the ax

	TOSHIBA	WEARNES
average sustained throughput		
32k block read (K/sec)	1943	2496
seek/read time		
Full (ms)	170	233
Random (ms)	94	120
cpu utilization		
600k (4x)	10%	23%
1800k (12x)	30%	71%
2400k (16x)	n/a	94%
burst speed		
32k block read (MB/sec)	7.5	2.7

boot verdict

7

PRICE: $148
COMPANY: Wearnes Peripherals International
PHONE: 408.432.1888
URL: mars.asiabiz.com .sg/~whwang/

Front Page Sports: Football Pro '97

The kick is... no good!

The blitz is on, and Sierra's *Front Page Sports: Football Pro '97* is the third-string quarterback about to get sacked.

With *Madden '97* and *NFL Quarterback Club* heating up the virtual stadiums, the PC is crowded with a slew of contenders vying for your attention. *FPS: Football Pro '97* may pack a buttload of statistics, and Sierra may have slapped a spanking new graphical paint job on their gridiron title, but along the way they forgot about a little-known feature: gameplay.

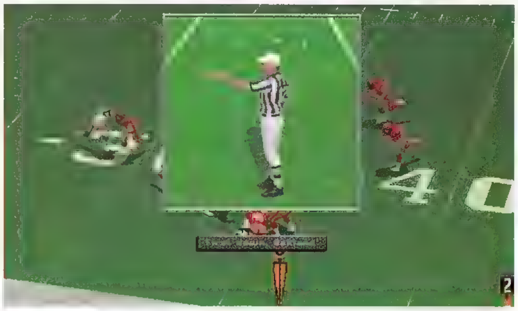
Football Pro '97 sports a 640x480, 256-color SVGA display flooded with a host of animated, 2D sprite-based players. With the almost unlimited variety of user-controlled camera views provided by the game's "Camera Angle Management System," you'd think Sierra would take a cue from *MDK* and render the sprites from multiple angles in order to take all the possible angles into account.

Alas, it's not to be.

From an overhead blimp perspective, players scamper about on their sides as if they're doing the curly shuffle. The sprites lack visual depth and detail, and despite supposedly being motion-captured, the economy of animation frames will remind you of the hand-held LED football games of your childhood.

Thankfully, *Football Pro '97* has all the correct team colors and names, and the stadiums are painted in the proper, albeit bland, textures. Rain and other weather effects are equally mundane, as are the ludicrous text-based play-by-play commentary and FMV referee windows that pop up after each and every down.

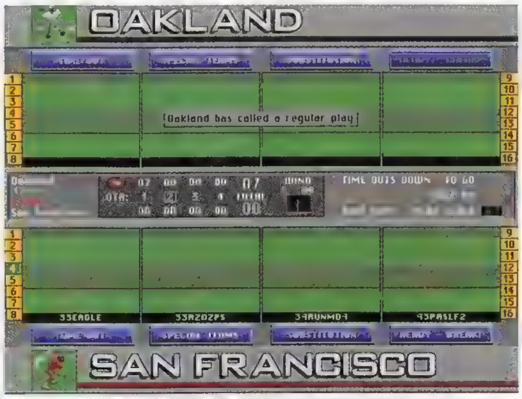
Football Pro '97's gameplay suffers even more than the graphics. Despite the fully movable camera, most of the angles are pretty useless, and you'll rely on the basic views such as the sideline or 3/4-isometric view for 99 percent of the gameplay. Anything else, and you'll find yourself cursing your game pad because of quirky control that will have your virtual Barry Sanders dancing in random directions.



There's *Front Page Sports: Football Pro '97*'s pesky FMV referee breaking up the action.

"Responsive" is not a word you'd associate with *Football Pro '97*.

While running the ground game is easy, aerial warfare proves a daunting task thanks to the way that passing is implemented. Do yourself a favor and set the camera to track the ball rather than using the disjointed, default setting, which instantly switches views when the ball is thrown. Also, the plethora of play selections is not always intuitive, since clicking on a play brings no visual or audible cue indicating that you've chosen it.



There are tons of plays, but the interface really sucks.

The digitized sounds convey the grunts and snarls of your field soldiers, but the music runs the gamut from decent NFL-Films-esque anthems to cheesy rock tracks.

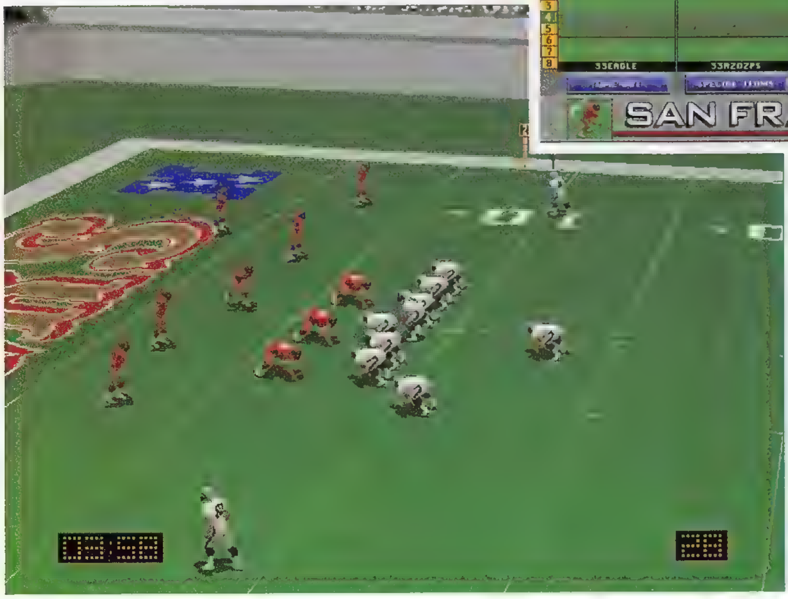
If the clunky gameplay frustrates you, consider playing as Commissioner, General Manager, or Head Coach. (Perhaps next year's version of *Football Pro* will contain options to play as water boy, equipment manager, or cheerleader.)

Still, if you're really into stats management and designing your own plays from scratch, then *Football Pro '97* has *some* redeeming qualities. You can, with a little help from the included update utility, import stats from previous *Football Pro* games. Wanna design your own customized flea-flicker? Thanks to the Play Wizard, it's a point-and-click away. Edit your favorite player's statistics in the game's Career mode so you can watch that rookie mature and eventually hobble away from the game, a broken man.

In the end, it's a question of whether you're willing to put up with substandard graphics and poor gameplay for some in-depth editing and statistics.

We don't think so.

— Andrew Sanchez



First and goal on the 8-yard line. Will the 49ers stop the Raiders' advance in *FPS: Football Pro '97*?

checklist

Multiplayer
LAN.......................... ☑
Modem...................... ☑
Internet..................... ☑

boot verdict

5

PRICE: $54.95
DEVELOPER: Sierra On-Line
PUBLISHER: Sierra On-Line
PHONE: 800.757.7707
URL: www.sierra.com

Bryce 2

Deep

TRY IT ON THE DISC

The slimy software salesmen who keep *Myst* a perennial Top 5 in the sales charts always pimp the game with the same line: "And the screens are just so beautiful!" Well, *Bryce 2* can pump out *Myst*-caliber (and beyond) screens every five minutes… no art skills required.

In fact, MetaTools boasts about how little experience you need to use its premier terrain-rendering package to render ray-traced exotic worlds with anti-aliased ease. It's true. Anyone can do it.

However, *mastering* this power is another matter.

Beneath the idiot-proof interface geared around randomly combining pregenerated graphic elements—skies, mountains, clouds, lakes, etc.—lies a very powerful set of algorithms with a steep curve toward mastery.

This depth is reflected in the 300-page manual that accompanies the software. (By contrast, MetaTools' most recent release, *PowerGoo*, shipped with a mere poster for documentation.) Packaged in between the reassuring "you can do it" and "just have fun" encouragements in *Bryce 2*'s manual are instructions and tips for using symmetrical lattices, Boolean objects, and alpha-channel effects.

Like all the best software applications, the true effectiveness of *Bryce 2* doesn't lie in these power features or in the extremely graphic interface. Instead, it must be judged by the chemistry of these elements and their ability to create infinite possibilities.

The slew of web sites dedicated to spreading the *Bryce* faith is a testament to the program's depth.

This power comes, as usual, at a price. Don't even think about loading *Bryce 2* with less than 16MB of free RAM. It'll gurgle along with the recommended 8MB, but you'll be so frustrated the only relief will be a cold shower. Only machines with 32MB and beyond should even consider playing in this fantasy world.

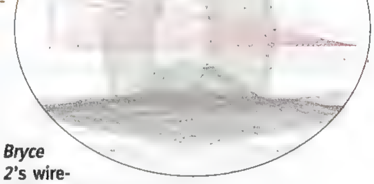
But PCs with the muscle to hustle will discover a slew of new features in this sequel, including new light sources, flyaround and nano previews, brush and flow terrain-painting tools, and a vastly more capable textures composer. The new texture engine can lead to problems when importing images from the original program, though.

Scenes such as the one above take mere minutes to assemble and render in *Bryce 2*.

The terrain editor, which converts grayscale to height, now sports a real-time 3D preview. While more sophisticated color-mapping palette choices are available, you're still constrained to black-and-white images when importing pictures. And the buttons for copying and pasting are gone. You'll have to Ctrl-C and Ctrl-V it.

This technique is one of the few ways to extrude a 3D logo in *Bryce 2*, given its limited importing abilities. The program only supports 3D metafiles and DXF formats, and barely at that. Files in the near-universal DXF format lose all textures in *Bryce 2*, may come in with strange distortions, or even hang up and refuse to play. *Bryce 2* controls importing with an extensible plug-in architecture, so we hope that better (and more diverse) filters will become available soon.

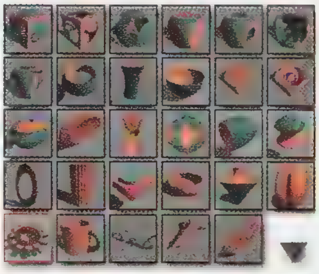
When it comes time to export your work, the shackles are even tighter. *Bryce 2* doesn't export models at all. Nada. Zip. The best you can do is output rendered files. Luckily, you can now generate them at any size your hard disk can handle (albeit at only 72dpi, so you'll need to calculate a file size and crank up the resolution in an image-editing program such as *Photoshop* for print work). These output images can be imported into some 3D programs as backdrops or merged with other rendered/scanned images in that image-editing package, but *Bryce 3* should learn to share its models in DXF format.



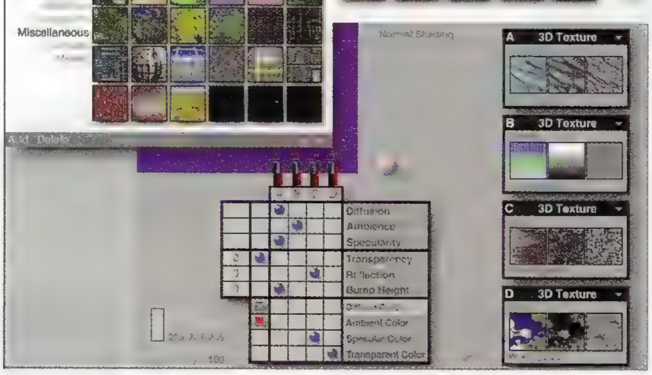
***Bryce* 2's wire-frame mode makes for fast editing.**

Still, other than a handful of such limitations, *Bryce 2* is all about enabling everyone to create what they previously had to be content to only dream about, and accomplishes this in its own little world.

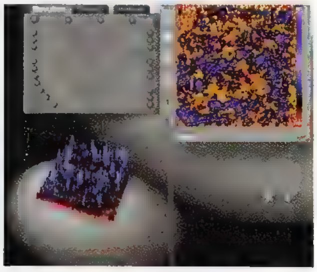
— *Brad Dosland*



A bevy of prefab Boolean objects (right) are collected in one of *Bryce 2*'s palettes.



***Bryce 2*'s capable Materials editor contains pop-up prefabs, too.**



The capable terrain editor in *Bryce 2* makes the 2D image 3D.

boot verdict

PRICE: $179
DEVELOPER: MetaTools
PUBLISHER: MetaTools
PHONE: 805.566.6200
URL: www.metatools.com

8

S/W

MDK

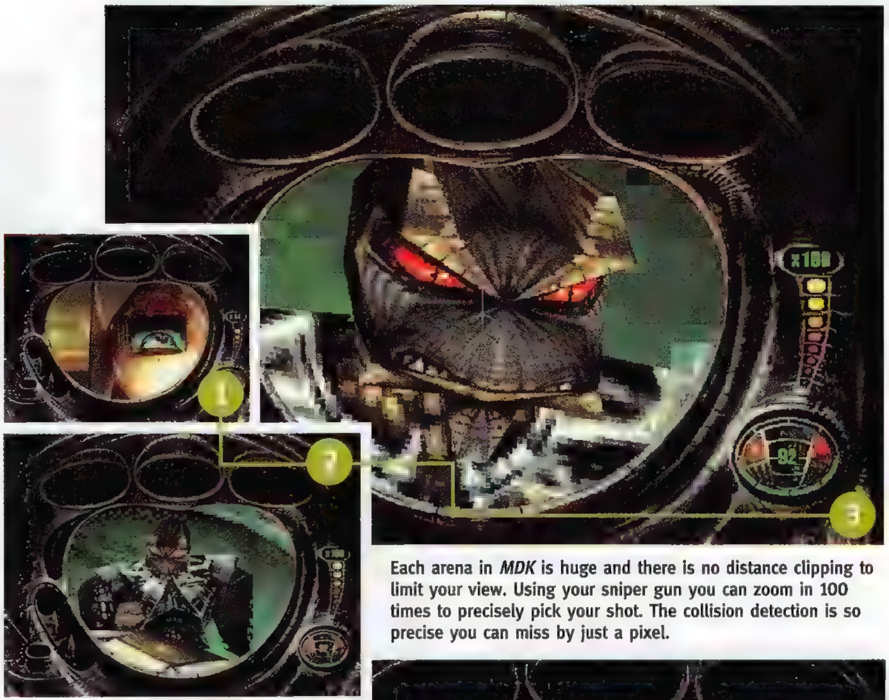
TRY IT ON THE DISC

A feast for the senses

boot KICK ASS! PRODUCT

It's a rare game that will make you sweat with adrenaline-pumping action, laugh out loud at a hilarious sight gag, marvel at incredible attention to detail, and dance with joy at the sheer technical brilliance of it all—in just five minutes. *MDK* is all that, and a bag of chips.

There is no FMV in this game to distract you from the lush environment and the plot is kept simple. Earth has been overrun by huge alien strip-mining cities that are crawling across the planet leaving death and destruction in their wake. You, Kurt Hectic, must plummet down from orbit to save the day. You're aided by occasional goodies parachuted to Earth by your mentor Dr. Fluke Hawkins, and by an occasional strategic air strike provided by your six-legged wonder dog, Max.

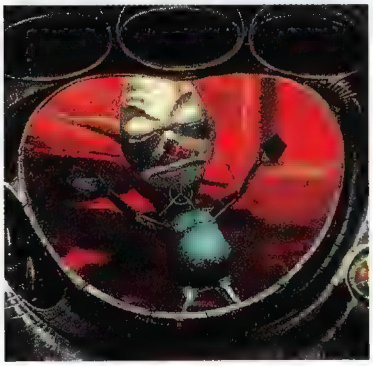


Each arena in *MDK* is huge and there is no distance clipping to limit your view. Using your sniper gun you can zoom in 100 times to precisely pick your shot. The collision detection is so precise you can miss by just a pixel.

There are six cities to fight your way through, each with 10 separate zones and a boss. As you advance, you will never feel a sense of déjà vu, each arena is unlike any other, and certainly unlike any other game you have ever played.

This world boss is so liquered up on Martinis and dazed with Jimmy Hendrix music that he doesn't even notice you—until you shoot off his nose.

Progress is very linear, but there are usually several different ways to advance—brute force guns blazing, stealthy sniper work from the shadows, or just using your wits. Puzzles are built into the environment; you are constantly challenged to figure just what it will take to kill the baddies and/or open the next door.



The graphics in *MDK* are stunning, running at 640x480 with the 256 color palette dynamically readjusted to make it seem like thousands. The world is true 3D, with the only sprite being your intricately pre-rendered character. The enemies are gorgeously textured and are animated with a touch of genius that makes them seem almost alive.

This grunt is taunting your from behind bulletproof glass. Shoot the falling bomb and see who gets the last laugh. *MDK* makes extensive use of transparent glass surfaces for some amazing effects.

Have you ever seen a polygonal character sneeze? Game arenas tend to be vast, with scores of enemies active on screen at once. All this and it plays fast too, even on a P133. The game is smoother than on a Pentium Pro 180.

Another example of *MDK* humor—this power-up gives you 150 percent health, but it also runs away screaming whenever you go near it.

MDK is planned to ship with 3Dfx acceleration that should look absolutely stunning with the addition of bilinear filtering, high color, and a slew of special effects. Later, Shiny plans to make available Rendition and PowerVR patches, with a Direct3D version to follow.

MDK is just about everything you could want a game to be, and it has an attention to detail that is rarely seen in games today. It lives up to its hype, and then some. Saving the world has never been so much fun.

— *Chris Dunphy*

checklist

- **MS-DOS** ☑
- **Win95 Native** ☑
- **DirectX**
  - DirectDraw ☑
  - DirectSound ☑
  - DirectInput ☑
- **Win95 Controllers** ☑

boot verdict

PRICE: $49.95
DEVELOPER: Shiny
PUBLISHER: Playmates Interactive
PHONE: 714.428.2100
URL: www.shiny.com

10

S/W

Marble Drop

A drop in the bucket

ON THE DISC

Marble Drop is easy to figure out and engaging to play. Unfortunately, with only 50 puzzles to solve, the engagement is over all too quickly.

The premise is simple: Complete the puzzles by dropping different colored marbles into the weird and wacky mousetrap-like invention. Get the marbles to fall into the color-coded bin in the correct order and you're onto the next level. Along the way your defenseless marbles will encounter myriad objects, the purpose of which is to alter the marble's projected course. Cannons shoot them across the room, swinging gates change which way they roll, and paintbrushes alter their color. You'll also have to contend with other frustrations including electrical switches, fire and ice, conveyer belts, and tumbler locks.

Your score is determined by how many marbles you need to complete each puzzle. Once a bin is filled with the correctly colored marbles, a circular blade appears and destroys any other marbles bearing down that particular path. You'll lose points for any marbles destroyed or purchased, but you can also earn bonus points for efficiency or for solving hidden puzzles throughout the game.

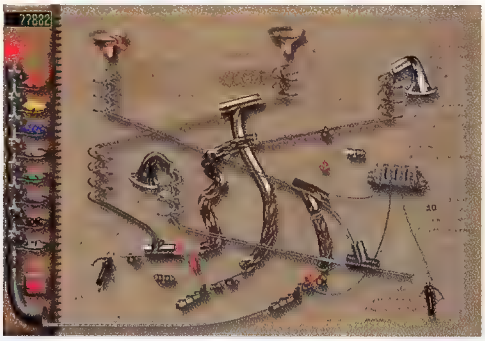
The historical blueprint motif of *Marble Drop* adds a unique look to the game. Screen resolutions up to 1024x768 are supported and there are nine speed settings (ranging from slow to fast) to choose from. Sound effects are limited and slightly repetitive.

On the whole, *Marble Drop* is cleverly crafted and mildly addictive. But the game could be improved with the addition of timed-mode play, multiplayer competition, and a level editor. As it stands, *Marble Drop* is good, but it isn't great.

— *Bryan Del Rizzo*

checklist

Win95 Native ....☑
DirectX
DirectSound ....☑
DirectDraw.............☑



Drop too many marbles at once in *Marble Drop* and you risk having them all destroyed by the warning detector.

boot verdict

PRICE: $29.95
DEVELOPER: Maxis
PUBLISHER: Maxis
PHONE: 800.336.2947
URL: www.maxis.com

7

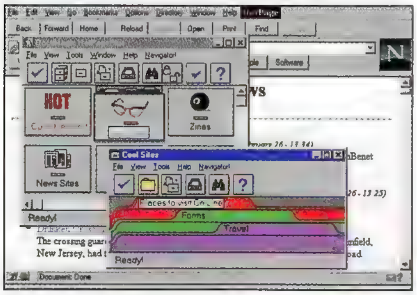
DocuMagix HotSuite

Hot and suite

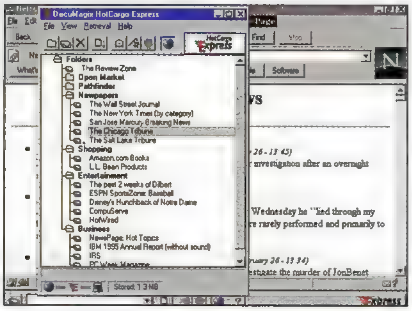
ON THE DISC

Can an application that intertwines itself with your browser so completely that the browser won't run without it, make up for intrusiveness with usability? Believe it or not, yes.

DocuMagix's *HotSuite* brings powerful tools to web surfing without costing an arm and a leg. Its three applications are: *HotMap*, *HotCargo Express*, and *HotPagePlus*.


HotPage
Back
Forward
Home
Reload
Open
Print
Find
Software
HOT
News Sites
Zines
Cool Sites
File
View
Tools
Help
Navigator
Forms
Travel
Ready!
Document: Done

***HotPage*'s file-cabinet setup makes it not only powerful, but easy to use.**


DocuMagix HotCargo Express
File
View
Retrieval
Help
HotCargo Express
Folders
The Review Zone
Open Market
Pathfinder
Newspapers
The Wall Street Journal
The New York Times (by category)
San Jose Mercury Breaking News
The Chicago Tribune
The Salt Lake Tribune
Shopping
Amazon.com Books
L.L. Bean Products
Entertainment
The past 2 weeks of Dilbert
ESPN SportsZone: Baseball
Disney's Hunchback of Notre Dame
CompuServe
HotWired
Business
NewsPage: Hot Topics
IBM 1995 Annual Report (without sound)
IRS
PC Week Magazine
Stored: 1.3 MB
Find
Stop
Software

***HotCargo* offers easy page downloading, but until its uninstalled your browser won't run without it.**

HotMap—Builds a map of contents for the web site you specify. While not particularly useful for sites that aren't deep and wide, *HotMap* works wonders for sites with a lot of quickly changing content, such as newspapers, which can be hard to navigate. Choose how deep you want *HotMap* to reach into the site and which elements you see on the list—text, images, etc.—then click on an item in the map and the browser pops up with the item. Maps can be searched, updated with new elements, or compared to other maps. Handy.

HotCargo Express—An offline web-site reader, *HotCargo* wins points for the ease with which users can add and configure sites for downloading. It loses points for rendering your browser unusable unless *HotCargo* is loaded. *HotCargo* supplies a reasonable number of possibilities for delivery of web pages, including extensive options for scheduled delivery and disk space limits, but its kneecapping of your browser might convince you to stick with another offline reader.

HotPagePlus—This on-screen filing cabinet enables you to not only save entire web pages into drawers and folders, but to import a variety of image types. Once an item is put in the in-box, filing it is drag-and-drop easy. File drawers and cabinets can be locked with password protection, and file cabinets, drawers, and file folders can be searched by keyword. High on the wow-meter.

HotPagePlus is the only one of these three applications that would stand out strongly on its own. But taken as a suite, this is a powerful toolbox for users who want to get more out of their surfing experience.

— *Tara Calishain*

boot verdict

PRICE: $49
DEVELOPER: DocuMagix Inc.
PUBLISHER: DocuMagix Inc.
PHONE: 408.434.1138
URL: www.documagix.com

8

S/W

DeBabelizer Pro

Tower of power

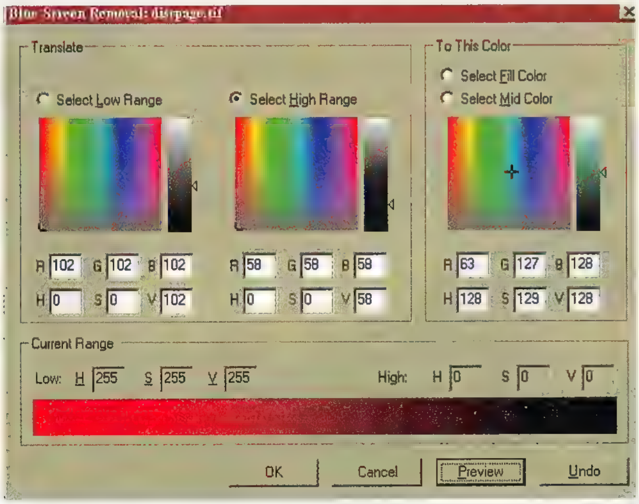
DeBabelizer Pro is an automated image processor that goes far beyond *Photoshop 4.0*'s new Actions palette for batch processing power.

Of course, it's not the kind of program you want to sit and watch churn through a 49MB true-color image while remapping it to 256 colors. Even on an MMX P200 it's a gruesome experience. Imagine 15 nonstop minutes of making the hard drive shake like a dog passing bones. In *Photoshop* the same image opens and processes in less than three minutes.

So why would anyone use *DeBabelizer* for image processing? Because its strength lies in processing images automatically. Only an idiot would sit and watch *DeBabelizer.* Just set it on a task and leave the room.

Before *DeBabelizer*, tasks such as converting several hundred BMP images to web-ready GIFs took several hours and severely dulled the minds of otherwise creative individuals. You can repeat any process in *DeBabelizer* on multiple images. This includes format translation between formats that read like Scrabble pieces randomly thrown into a heavily punctuated sentence: Macintosh, Unix, X Windows, Silicon Graphics, Commodore Amiga, Atari ST, and just about every Windows graphics format known to humankind.

DeBabelizer can even batch-process commands without loading each image individually. A batch list can be created by browsing or dragging the files directly from Explorer to the batch list window. They don't all have to be the same file format and there's no limit to how many images you can process.



○ Select Low Range
● Select High Range
○ Select Fill Color
○ Select Mid Color

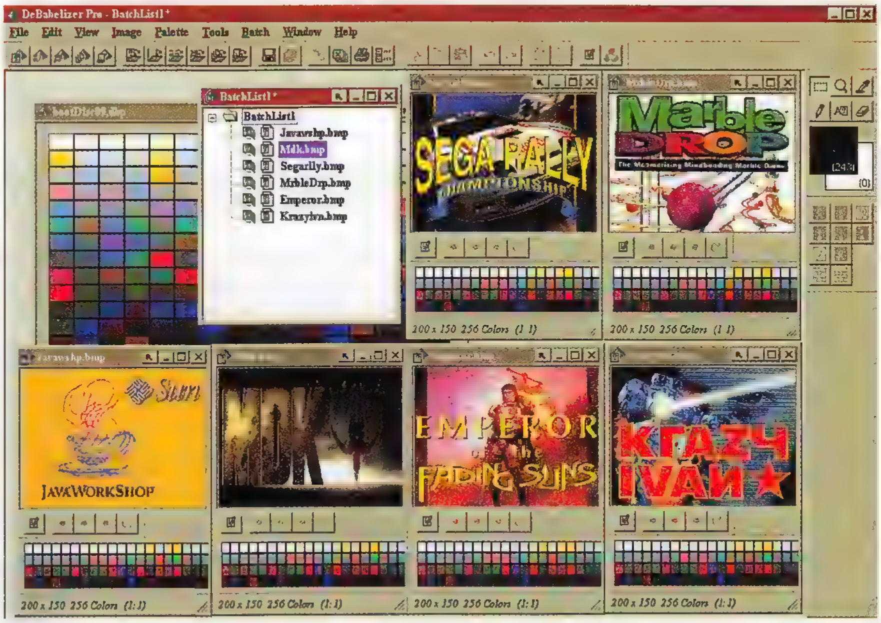
R 102 G 102 B 102
H 0 S 0 V 102

R 58 G 58 B 58
H 0 S 0 V 58

R 63 G 127 B 128
H 128 S 129 V 128

Current Range
Low: H 255 S 255 V 255 High: H 0 S 0 V 0

The Blue Screen Removal tool, which automatically separates image elements, is one of *DeBabelizer's* most powerful tools.



BatchList1
Javawshp.bmp
Mdk.bmp
Segarlly.bmp
MrbleDrp.bmp
Emperor.bmp
Krazyivn.bmp

DeBabelizer's batch lists make it easy to make all the _bootDisc_ images speak the same dialect.

Processing scripts are built just as easily. Each operation is recorded in a log that can be viewed and dragged into the script window. You can add specific operations to scripts and drag and drop between script windows. For monkey-see-monkey-do simplicity, the WatchMe function records every operation performed on an image and generates a script.

While CMYK is not supported, palette conversion—primarily for the web or software development—is the program's strength. This is evident in how easily *DeBabelizer* adds and subtracts colors and sorts and merges palettes, as well as features that let you protect specific colors from manipulation.

If you value the time (and return visits) of your web page audience then all the fat images you're planning to post should be run through *DeBabelizer.* Sampling images down to smaller palettes without dithering creates files that look great and load fast. The SuperPalette feature creates a global palette for a group of images automatically, like an anal retentive on speed sorting your laundry into 256 piles of the most commonly repeated colors.

Patches available on Equilibrium's web site give the *DeBabelizer* engine a shot of MMX acceleration, which gives processor-intensive tasks such as palette remapping and blue screen removal the biggest boost. Compare the six minutes needed to remap the palette of a 6MB AVI on an MMX-enhanced Pentium 200 to the dog-slow 14 minutes it takes on a P166. MMX optimization allows the program to handle each pixel's RGB components simultaneously.

Rounding out the package are a group of forgettable image processing tools that allow scaling, flipping, trimming, rotating, and resolution tweaking. Of these, only the powerful Blue Screen Removal, Field Interpolation (for merging and separating scan lines), and Hot Pixel Fixer (for correcting NTSC or PAL color ranges) are worth mentioning.

Toss in the ability to batch-process *Photoshop*-compatible plug-ins and you have a package that you can trust to do your menial labor when you turn out the lights and go home for the night.

— Sean Downey

boot verdict

PRICE: $595
DEVELOPER: Equilibrium
PUBLISHER: Equilibrium
PHONE: 800.524.8651
URL: www.equilibrium.com

8

H/W

National Microcomputers Expert **MMX 200**

It's strong to the finish

Tired of bullies who have more expansion slots than you kicking sand in your face? Did name-brand "ultimate" systems with better sound and killer video solutions steal your chick? National Microcomputers' Expert MMX 200 wants to pump you up. But don't rush back to the beach too fast.

The workout begins with cracking open the plain-Jane medium-size tower—a one-screw exercise. Flexing 32MB of EDO DRAM (expandable, via four SIMM slots and one DIMM slot, to the 430VX chipset's maximum of 128MB), ASUSTek fleshes out this P200MMX system's backbone with its P55TVP4 AT motherboard. The 256K of onboard pipeline-burst cache and 256K more via COAST module bulk up to a total of 512K L2 cache. Curiously, the system ships with the jumpers set to utilize *only* 256K of this cache (see below).

Like most ASUSTek motherboards, the NMC Expert ships with three PCI slots, two ISA slots, and one shared ISA/PCI slot (which sports ASUSTek's Media Bus Revision 2.0). Three open PCI slots will blacken the eye of any manufacturer who tries to force systems with fewer slots down your throat.

Unfortunately, one of those PCI slots is rendered impotent by the PS/2 mouse connector mounted on an expansion-slot cover. Moving all the serial and parallel ports from the two extra plates above the expansion slots directly onto the case and putting the PS/2 connector in their place would have allowed that third PCI slot to live up to its potential.

But don't plan on installing any full-length PCI cards. The clumsy combo of heat sink and integrated fan is in the way. And nimble fingers are called for when snaking through the ribbon cables that obstruct the SIMM and DIMM slots.

The best way to avoid a conflict is to learn to get along, and quality components ensure maximum compatibility. U.S. Robotics lends their Sportster 33.6 PnP fax/modem, while a Creative Labs Sound Blaster 32 PnP brimming with 2MB of RAM and armed with E-mu Systems' EMU8000 wavetable synthesizer, occupies another ISA slot. No fake software wavetable-synth crap here! The tinny Eastern Acoustics' AX-5107 subwoofer/satellite speaker system cramps the capable card's MIDI muscle.

A Matrox Mystique with 4MB SGRAM fills the one occupied PCI slot. While the Mystique provides 2D Windows and DOS performance that can bend steel bars in its bare hands, it can't even open the stuck lid of a mayo jar when it comes to 3D acceleration. Matrox doesn't believe the world wants bilinear filtering.

ADI's clear Microscan 5V 17-inch SVGA monitor deftly handles display chores with its healthy refresh rates.

With one 3.5-inch and two 5.25-inch drive bays free, the Expert provides the necessary power cables and EIDE connectors to grow into. Vertically mounted next to the internal power supply sits a zaftig Western Digital 3GB EIDE hard drive. A CyberDrive 120D 12x EIDE CD-ROM drive rounds out the system's hardware configuration, which boasts above-average Windows performance, but is a no-show in DOS, because the MSCDEX.EXE doesn't load and configure correctly when you restart in DOS mode.

The Expert MMX 200 punched through all our benchmarks like a spinach-snackin' sailor. The 200MHz P55C and Mystique combo set an all-time high in our Windows 2D benchmark, while the NMC confidently cruised the beach of all our other benchmarks.

Despite design shortcomings, the National Microcomputers Expert MMX 200 comes back to kick the ass of those big-name bullies.

— *Andrew Sanchez*

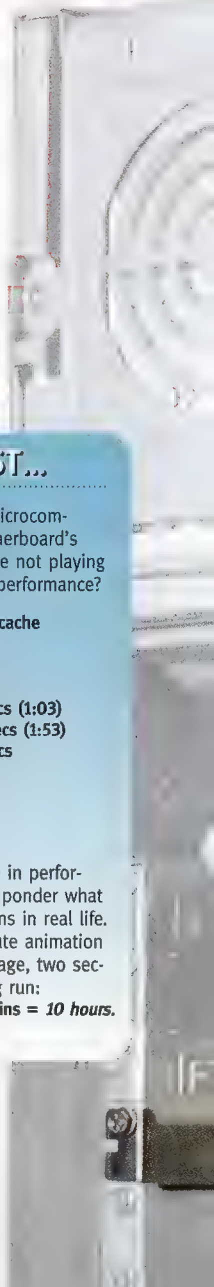
To COAST or not to COAST...

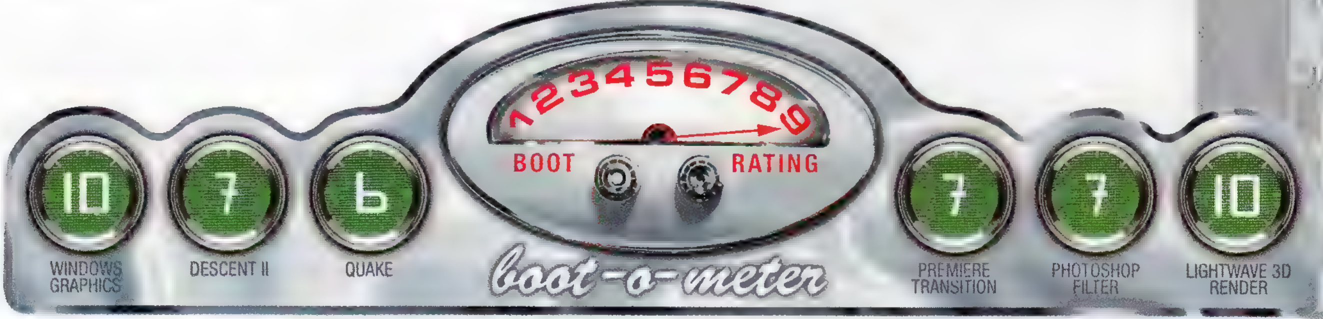
It may have been an oversight at National Microcomputers' manufacturing plant, but if your motherboard's only seeing half the installed L2 cache, you're not playing with a full deck. Does the extra 256K affect performance?

TEST RESULTS	**256K cache**	**512K cache**
Graphics WinMark	**55.7**	**55.8**
Quake	**13fps**	**14fps**
Descent II	**32fps**	**33fps**
LightWave 3D	**65 secs (1:05)**	**63 secs (1:03)**
Adobe Photoshop	**116 secs (1:56)**	**113 secs (1:53)**
Adobe Premiere	**41 secs**	**40 secs**
CD-ROM	**838**	**852**
Disk WinMark	**1170**	**1160**
CPUmark16	**397**	**431**
CPUmark32	**378**	**419**

While the CPUmarks show a distinct increase in performance with 512K engaged, take a minute to ponder what two seconds off a *LightWave 3D* render means in real life.

Now calculate what it takes for a 10-minute animation (600 secs) rendered at 30fps. If, on the average, two seconds are saved, you'll really save in the long run:
2secs x 30fps x 600secs = 36000secs = 600mins = *10 hours.*





A complete breakdown of benchmark results is available on the *bootNet.* Point your browser to www.bootnet.com

under the hood

the brains

CPU	Intel Pentium 200MMX (P55C)
L2 Cache	512K (256K on m/b + 256 COAST external pipeline burst)
RAM	32MB EDO DRAM expandable to 128MB
Video	Matrox Mystique with 4MB SGRAM

the brawn

Hard Drive	Western Digital 3.0GB EIDE
CD-ROM	CyberDrive 12x IDE
Expansion Bus	Three full-length PCI slots (one occupied); two full-length ISA slots (both occupied); one shared ISA/PCI/ASUSTek Media Bus
Fax/Modem	U.S. Robotics Sportster 33.6 internal fax/modem

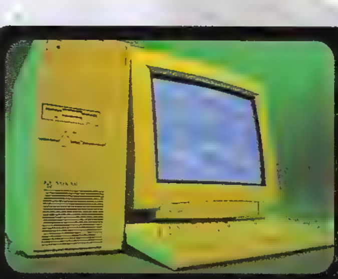
the beauty

Monitor	ADI Microscan 5V 17-inch SVGA
Sound	Creative Labs Sound Blaster 32 PnP with 2MB RAM
Speakers	Eastern Acoustic AX-5107 subwoofer/satellite system

the bundle

Microsoft Windows 95 • OSR/2 • Encarta 96 • Microsoft Dangerous Creatures • Microsoft Explorapedia • Microsoft Works • Microsoft World of Flight • Microsoft Scenes Undersea Collection • Microsoft CD Sampler

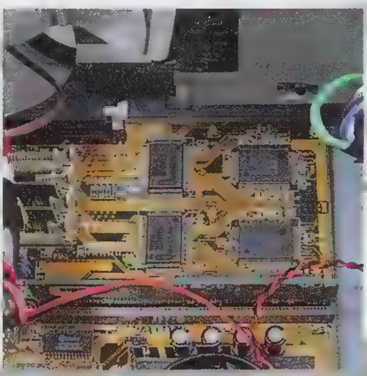
the goods



National Microcomputers' Expert MMX 200 is proof-positive that you don't need big-name vendors in order to get quality components.

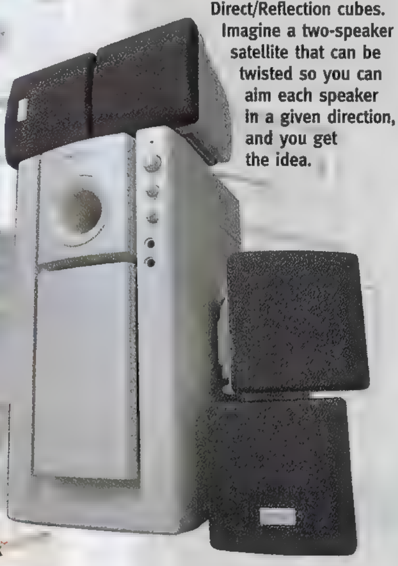
Cashing in Your Chips

ASUSTek provides the first 256K of L2 cache, the COAST module fills the rest.



Multidirectional Madness

The AX-5107 speaker system's satellites bear a striking resemblance to Bose's Acoustimass-5 Direct/Reflection cubes. Imagine a two-speaker satellite that can be twisted so you can aim each speaker in a given direction, and you get the idea.



Honey, I Hid the SIMMS

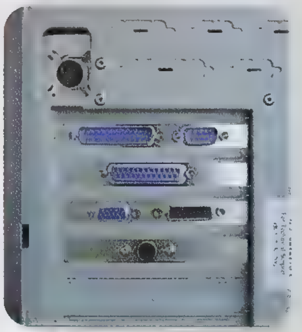
Get out your machete! RAM sockets lurk behind a jungle of ribbon cables and the single DIMM socket suffers worse than its four 72-pin counterparts.

Full-Length Interruptus

Curse that AT formfactor! While the massive heat sink with integrated fan may help chill out that Pentium 200MMX CPU, it puts a serious cramp on adding any full-length PCI cards.

Don't Clog My PCI!

A prize more coveted than manna from heaven—a free PCI slot—was sacrificed to appease this system's PS/2 urges. Ugh!



Afraid of a Little Violence?

Why National Microcomputers didn't punch out those holes and mount their serial and parallel ports directly on the case remains a mystery.

Catching the Media Bus

While ASUSTek would like you to use their Media Bus, we think you'd rather shove a 3D, digital sound card, add-on 3D accelerator, or an Ultra-Wide SCSI in there.

+	−
•Matrox Mystique (great 2D performance apps)	•Hard to get to SIMM slots
•SIMM or DIMM slots	•Won't accept full-length PCI cards
•Solid performance	•One PCI slot blocked
•Sound Blaster 32 with 2MB	•No MMX titles
	•Tinny speakers
	•Cache disabled

boot verdict

8

PRICE: $2,495 w/monitor
COMPANY: National Microcomputers Inc.
PHONE: 801.265.3700
URL: www.natmicro.com

S/W

Emperor of the Fading Suns

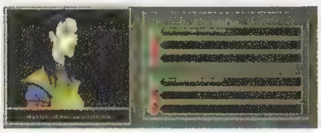
Dune opera of space risk management

TRY IT ON THE DISC

Emperor of the Fading Suns is *not* designed for novice users. But, if you dream of a war game steeped in future-Gothic overtones, statistics-laden role playing, political intrigue, and interplanetary warfare, this game's your ticket to bliss.

Emperor's mixture of pre-rendered and hand-drawn 640x480, 256-color graphics plus the detail of all the units are impressive, as well as the Smacker-compressed CG cinematic sequences. Don't expect massively animated sprites akin to *WarCraft*—the majority of *Emperor*'s action is buried between mounds of menus and an overhead hex-based map. Battles are handled via a simple, static screen.

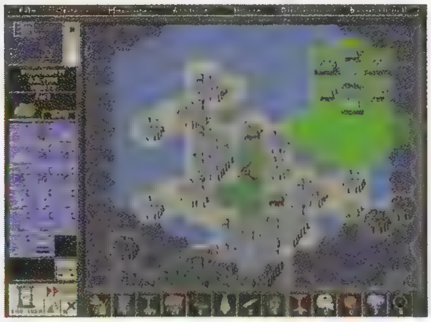
There are more than a hundred units to build, and all require countless hours of research. The game interface isn't intuitive, and moving units from one place to another can be frustrating. By right-clicking a group to move into a hex, the unit will blink; by left-clicking on a hex further than one hex away, a group of X's will follow. Green X's show the distance the group can move, red X's mean the group will have to wait until the next turn to reach that distance.



Emperor's level of detail is impressive.

As you forge ahead in the battle to become leader, you encounter treachery and deceit, battle the forces of evil, deal with greedy merchants, and contend with the Church for absolute power. As your struggle continues, you form strategic alliances, wage war, and develop the storyline to become emperor.

There are several ways to win the game, and it never plays the same way twice. With elements of *Risk*, *Dune*, and the *General* series from SSI, *Emperor* delivers hours of strategy that will satisfy even the most advanced gamer. Don't expect to play this game in one sitting. It will take between 80 to 100+ hours to complete, and you can play with four of your friends by e-mail, with the game automatically prompting each player for their turn.



Emperor of the Fading Suns **is rich in tactical warfare.**

The detailed management of *Emperor of the Fading Suns*' AI can be confusing. Much of your time is spent micro-managing your resources and building up advanced technology to move your people forward. If you enjoy spending countless hours building up troops, advancing your resources to forge new weapons, and shipping technology, while managing countless battles across a galaxy, you'll love this game—or at least learn to respect it.

— *Tommy Maple*

boot verdict

PRICE: $49.99
DEVELOPER: Holistic Design
PUBLISHER: SegaSoft
PHONE: 888.734.2763
URL: www.segasoft.com

7

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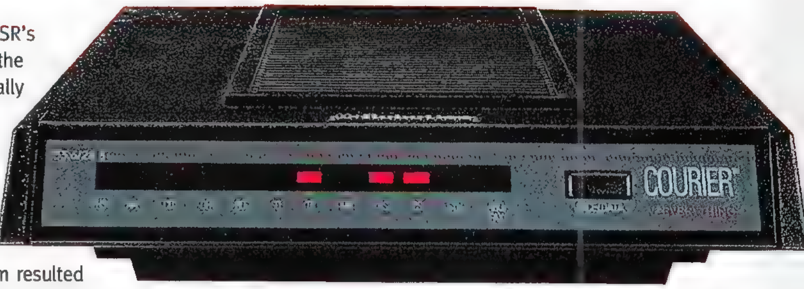
boot

U.S. Robotics Courier V.Everything

Well, almost everything...



The Courier V.Everything's case is slim and sleek, and its bright red LEDs will keep you informed about your online status.

It's true, the Courier V.Everything external modem doesn't come with the cable necessary to connect it to the serial port. It does however come with some pretty hefty manuals, a speaker volume slider, plenty of info on the underside of the unit, flash upgradeability to U.S. Robotics' new X2 technology, and some decent transfer times.

We were put off by the modem's installation procedure, which entails: installing the modem as the standard modem type (Win95 auto-detects it as Plug-n-Play), then connecting to USR's FTP site or BBS system, downloading a new 55K INF file, then removing the modem and reinstalling it again using the new file. This exercise is absurd. USR should have supplied the latest version of driver.

Comparatively, the Courier V.Everything ranks in the upper middle of the performance chart. FTP transfers of our standard 1MB text file were its strong point, with a time of 154.23 secs at 7270cps; the 1MB WAV file timed in at 618.13 secs at 1670cps. We initially did this same test with the standard modem configuration (before going through USR's procedure) and the times were actually *faster* for the text file (134.24 secs at 8360cps). Direct connection to another 33.6Kbps modem resulted in a text transfer of 291 secs at 3849cps, and WAV transfer of 634 secs at 1625cps.

Don't be mislead by the Voice/Data switch either. It is not for ASVD calls. This novelty is just a way to "temporarily" switch from a data connection to a voice connection without disconnecting. The hitch is that you need to be connected to another USR modem with this same feature as well.

You can be assured that you're buying a quality product if it bears the U.S. Robotics name, but considering the Courier V.Everything's outrageous price; lack of voice mail and true ASVD; annoying installation; and merely average transfer times, hold out for X2.

— Daevid Vincent

boot verdict

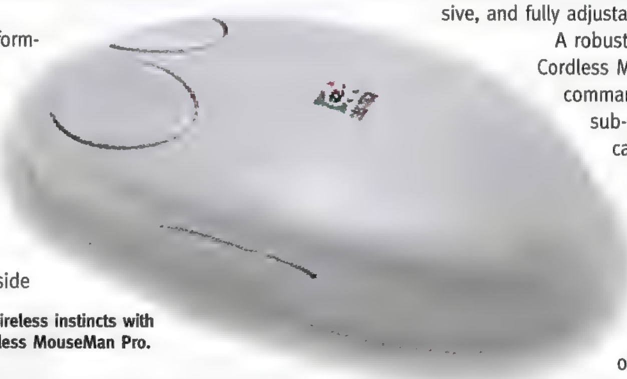
PRICE: $299.95
COMPANY: U.S. Robotics
PHONE: 800.342.5877
URL: www.usr.com/business/30403.html

5

Cordless MouseMan Pro

If you love somebody, set them free

boot KICK ASS! PRODUCT



Unleash your wireless instincts with Logitech's Cordless MouseMan Pro.

With flawless performance and a wealth of strong utilities, the Logitech Cordless MouseMan Pro frees your desktop from the tyranny of tethered mice.

This right-handed rodent's new form-factor resembles a slightly lopsided sliced egg. Fitting snugly in your hand, the two concave buttons situated on top are almost perfectly laid out to rest under your fingertips, while the MouseMan's rounded edges help ward off undue strain on your palm. The thumb button mounted on the left side grants three-button functionality.

The Cordless MouseMan Pro uses radio frequencies to talk to its receiver (which can be positioned up to six feet away), so there's no need to worry about line-of-sight problems.

Overall performance nary differed between the MouseMan Pro and its bound brothers, with no perceptible lag. Cursor control is tight and responsive, and fully adjustable within the mouse's control panel.

A robust suite of mouse utilities accompanies the Cordless MouseMan Pro, including the HyperJump commands, which allow you to activate a mini sub-window within your workspace where you can instantly access eight commonly used commands, such as minimize and maximize, as well as re-sizing and closing... anywhere on your screen. Unlike Microsoft's Intellimouse (reviewed in *boot* 05), the Cordless MouseMan Pro's functionality is program independent so you can enjoy these enhancements without waiting for specific programs to support it. If you don't like the way your buttons are set, feel free to reassign functions via the Mouse Control Panel. Drivers for DOS, Windows 3.11 and 95 come standard, although NT-native drivers are sorely lacking.

With the Cordless MouseMan Pro, you'll never again get your wires tangled. This is about as sexy as a wireless mouse gets.

— Andrew Sanchez

boot verdict

PRICE: $79.99
COMPANY: Logitech
PHONE: 800.231.7717
URL: www.logitech.com

9

H/W

Enter the **ISDN Zone**

Double your speed-limit breaking trouble

Just a year ago those brave souls with the need for speed who bought a $600 ISDN terminal adapter, found that neither their ISP nor their phone company could support the expensive new hardware. Even if they did, the installation fee could equal the price of the hardware—not to mention the hefty monthly service charges.

Things are different today. Phone companies such as Pac Bell and GTE finally offer reasonable ISDN rates (expect to pay about $100 for the install and $25 a month for unlimited access in major cities). And while it's still a tad more trouble to get ISDN, the extra effort is well worth the results: two bearer channels (eight channels) handle voice and data at 64Kbps; and bonded, those eight channels can give you a potential 128Kbps throughput—or up to four times higher with some new compression techniques.

Convinced? Now the question is: Which ISDN modem to buy?

— Lauren Guzak

Courier I-modem

When it comes to modems, it's hard to beat U.S. Robotics; and the Courier I-modem is no exception.

The Courier I-modem is deluxe. It includes both an ISDN TA and the U.S. Robotics 33.6/V.34 Courier analog fax/modem, and is available as either a bulky external or svelte ISA card.

The I-modem features what U.S. Robotics calls "V.Everything technology," which means that it's backward compatible with everything prior to the V.34 standard.

Like the DataBurst, the I-modem utilizes Turbo PPP, but goes a lot further. In most ISDN TAs that don't incorporate an analog modem you have to switch your line depending on the type of connection you want to make (that is, analog to dial up a BBS, or digital to log on to your ISP). The Courier I-modem uses Universal Connect, a technology that automatically detects ISDN or analog calls and connects at the highest possible digital or analog rate supported by the device at the other end of the connection. This on-the-fly detection is a nice feature for those tired of switching back and forth to handle analog signals vs. digital packets.

Win95 users will get the best performance out of the I-modem because of Multilink PPP and advanced compression technology. Theoretically, this translates into 512Kbps throughput (yes, that's 512Kbps!). In the real world of jammed routers and over-stretched servers, expect transfer rates of more earthly proportions.

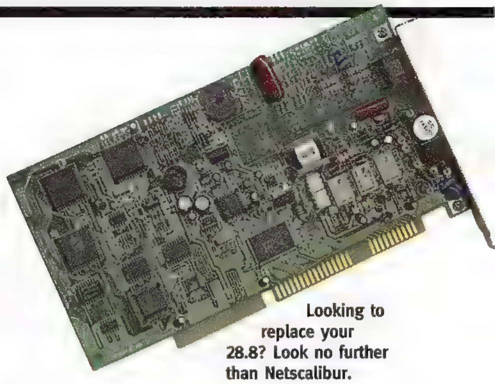
Flash ROM upgrades are downloadable from U.S. Robotics' web page for the Courier I-modem to bump it into the 56.6Kbps realm, and come with a five-year limited warranty with factory repair or replacement.

boot verdict

PRICE: external $399; internal $339
COMPANY: U.S. Robotics
PHONE: 800.342.5877
URL: www.usr.com

9

Tyan N1732D Netscalibur



Looking to replace your 28.8? Look no further than Netscalibur.

If you've decided to dump your OTS line in favor of ISDN, the Netscalibur, a new PnP internal ISA card ISDN-analog fax/modem from Tyan, might be the ticket.

The Netscalibur features the Siemens chipset on the ISDN side, the PC-TEL chipset with the 33.6/V.34 Kbps analog fax/modem (software upgradeable to 56K), and supports MS PPP and Multilink PPP conversion.

The ISDN-analog modem combo is particularly nice in an ISA card because it can save you a lot of desktop space—which could total the footprint of one external ISDN TA and an analog modem. The Netscalibur also comes with a virtual LED display to track your B-channel activity and even diagnose problems.

The Netscalibur is theoretically PnP, but we experienced some minor problems setting it to the correct COM port. Still, we had it up and running in a reasonable amount of time using the Netscalibur Wizard.

The wizard isn't very elegant, as there are some potentially confusing—yet crucial—software installation sequences (you have to install the Microsoft ISDN Acceleration Pack before installing the Netscalibur drivers, despite the fact that the drivers' install window comes up first). The wizard disc does, however, include a nice HTML-based manual full of helpful information such as ISDN diagnostic tools, a list of AT commands, and a hyperlinked directory of national ISPs that support ISDN.

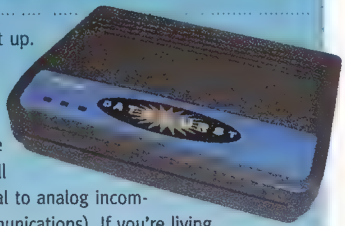
boot verdict

PRICE: $200
COMPANY: Tyan
PHONE: 408.956.8000
URL: www.tyan.com

7

U.S. Robotics DataBurst ISDN

Jack in and tune out



The DataBurst modem is ISDN, straight up. It's a basic unit for those who want ISDN but don't need lots of bells and whistles. Given that this is not a perfect digital world, and most people are still running analog modems, you'll still need an analog modem to avoid digital to analog incompatibilities (e.g., for fax and BBS communications). If you're living unhappily with an old 9600bps, you'd be better off spending a little more for an integrated ISDN/analog box such as the Courier I-modem.

The DataBurst features U.S. Robotics' proprietary Turbo PPP, a set of "high-performance ISDN standards-based features," including Multilink PPP, support for Multiple Compression Types (i.e., the big three: Stac, Microsoft, and Ascend), and Bandwidth-on-Demand which gives you dynamic allocation of the additional B-channel. All of this means that the DataBurst can adjust on the fly to best get you the information you're seeking.

boot verdict

PRICE: $279
COMPANY: U.S. Robotics
PHONE: 800.342.5877
URL: www.usr.com

8

H/W

ScanAce III

Yerrrrrr outta here!

Sure. Some lame-ass knuckle-baller may mow down the batters one after another. But who wants to sit and watch all those hypnotic slow balls waft into the catcher's mitt? Waiting for the ScanAce III's slow-pitch scans will have you yawning through your chaw.

While all of the specs for this SCSI-based flatbed scanner are right in the strike zone: 36-bit color (a whopping 68.7 billion colors!), 600x1200dpi optical resolution, and single-pass power, the two things that would make this a homer—performance and price—fall decidedly short.

The ScanAce III sports a 1MB Scanning Buffer and two external SCSI connectors to choose from: 25 pin and 50 pin. The unit ships with its own proprietary ISA 8-bit SCSI card with an inferior 25-pin connector, complete with a four-foot SCSI cable.

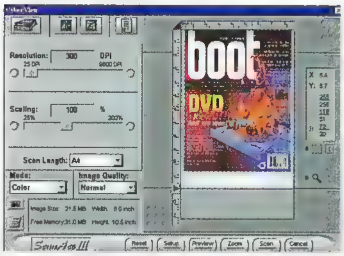
Our test scan of a full A4 page with an 8-bit color depth at 300dpi of optical resolution took 9 1/2 minutes. The same test using an Adaptec 1535A SCSI card took almost two minutes less (and the scanner was no faster connected to a 2940 PCI SCSI card). Not pretty for a $900 scanner.

The bundled *CyberScan* TWAIN-compliant software allows you to specify media types (color, line-art/text, gray and halftone, or transparencies using the optional mini-DIN connector). You can also control image size, cropping, scaling (up to 200 percent), and resolution from 25dpi up to 9600dpi. Also included is a gamma curve window for separate RGB channel adjustment. Displaying the image size next to the amount of free memory you have to work with is a handy feature, as is the variable zoom-in feature, which allows you to enlarge small areas of the document for more accurate image manipulation.

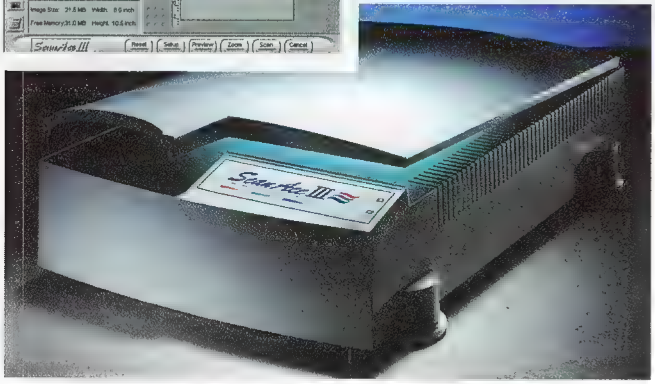
The software lacks manual adjustments for the white and black points, and the ability to type in manual gamma settings or adjust the slider (they're there... they just don't work).

If you're a professional who makes heavy use of a scanner, look elsewhere.

— *Sean Cleveland*


Resolution: 300 DPI
Scaling: 100 %
Scan Length: A4
Mode: Color
Image Quality: Normal
Image Size: 21.5 MB
Width: 8.0 inch
Free Memory: 31.0 MB
Height: 10.5 inch
25 DPI
9600 DPI
25%
200%
boot
DVD
ScanAce III
Reset
Setup
Preview
Zoom
Scan
Cancel

Despite its professional looks, the ScanAce III's non-intuitive interface lacks guts.


ScanAce III

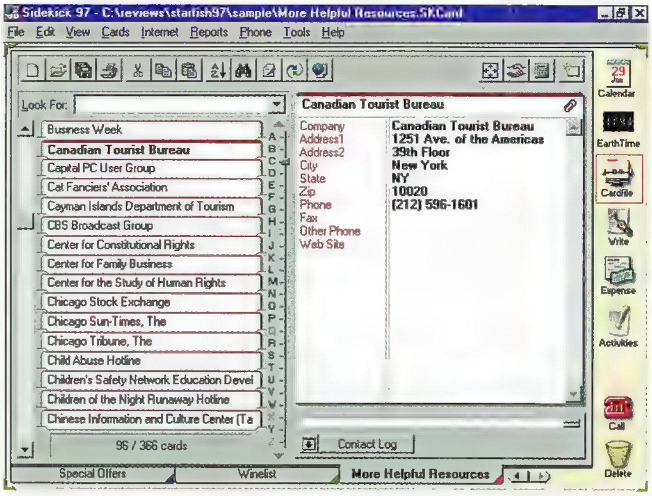
Make sure that you have the desk space for the mammoth ScanAce III.

boot verdict

PRICE: $899
COMPANY: Pacific Image Electronics
PHONE: 310.214.5281
URL: www.scanace.com

5

S/W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State: NY
Zip: 10020
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Cayman Islands Department of Tourism
CBS Broadcast Group
Center for Constitutional Rights
Center for Family Business
Center for the Study of Human Rights
Chicago Stock Exchange
Chicago Sun-Times, The
Chicago Tribune, The
Child Abuse Hotline
Children's Safety Network Education Devel
Children of the Night Runaway Hotline
Chinese Information and Culture Center (Ta
Contact Log
Special Offers
Winelist
More Helpful Resources
Calendar
EarthTime
Cardfile
Write
Expense
Activities
Call
Delete

Sidekick 97 **has a row of buttons on the right side of the screen, which make navigating easy without crowding the program.**

Starfish **Sidekick 97**

Controlling the chaos

TRY IT ON THE DISC

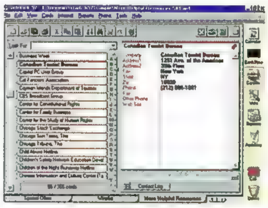
Constantly looking for the perfect time and task manager? *Sidekick 97* almost delivers. This is not your ordinary address book/to-do list/calendar. *Sidekick* integrates nicely with your existing Internet e-mail applications, transferring your current address books into its card file easily. A 388-entry *Eudora* address book was assimilated in mere seconds.

Once the information is transferred, there's a lot to do with it—*Sidekick*'s extras include a splendidly organized screen for handling and arranging text files, a utility for seeing and converting times around the world, an on-screen phone dialer, even a scheduler that uses your existing e-mail program to make appointments across the Internet. (And this just scratches the surface; where else can you find a PIM that can report the latitude of London and tell you how many seconds there are in a year?)

Ironically, *Sidekick*'s Achilles' heel is in one of its core applications: the address book. While the other PIM standards, the calendar, and to-do list are well-designed and easy to use (the tabbed to-do list provides both a full list of activities and shorter lists broken down by task types) the address book badly needs an overhaul. The card file metaphor just isn't as intuitive as a page from an address book might be. This screen is the least comfortable to use, yet is the most vital to the application.

If you're looking for a PIM offering everything sans the kitchen sink and are willing to overlook the clumsy address book, take a long look at *Sidekick 97*. Your desk *and* your wallet will thank you.

— *Tara Calishain*



Sidekick 97 **offers calendar views in several formats—an easy-to-use extra.**

boot verdict

DEVELOPER: Starfish Software
PUBLISHER: Starfish Software
PRICE: $49.95 off the shelf; $39.95 downloaded from Starfish or upgraded from previous versions of *Sidekick*; free to current users of *Starfish Internet Sidekick*
PHONE: 888.782.7347
URL: www.sidekick.com

7

H/W

Stick It!

Beat me up, beat me down

What hurts worse than Sonya Blade performing a bone-crunching nine-hit combo on your pathetic little fanny? Playing a fighting game with a game pad!

Hurtling fireballs in Street Fighter Alpha *or breaking necks in* Virtua Fighter 3 *was never meant for a game pad—motions and button sequences honed in the heat of arcade battle are poorly translated when they come home to a game pad that looks and performs nothing like the arcade.* — *Andrew Sanchez*

ENTER
ESC
SHIFT
CTRL
DEL
SPACE
IBM PC COMPATIBLE
POWERRAMP
HYPER PROGRAMMABLE 10 IN 1

Despite it's ugly appearance, the PowerRamp packs some programming sizzle and excellent response.

PowerRamp

Weighing in at well over two pounds, the PowerRamp PC fighting stick will help you perfect those crushing attacks and swift retreats.

A burly metal-based beast encased in plastic, the PowerRamp plugs inline with your present keyboard—no connection to your joystick port or special software drivers are necessary. Every command is actually a keystroke. Eight ergonomically-aligned base buttons dominate the scenery while a smorgasbord of features, such as auto-fire, dot the surroundings.

Almost every PowerRamp command can be reprogrammed to suit your needs. Up to 10 keyboard strokes can easily be assigned to one button (except for joystick maneuvers)—perfect for code monkeys or pathetic fighting game wannabes who can't remember how to dismember.

Since the PowerRamp *is* a keyboard, you can conceivably link multiple units in series for multiplayer mayhem, but prepare to do some *serious* reprogramming. Every PowerRamp ships with the same keystrokes assigned to each button. While remapping buttons is simple, ACT Lab thoughtfully provides a Windows graphical interface to program, test, and load the PowerRamp, as well as preprogrammed macros you can upload.

boot verdict

PRICE: $59.99
COMPANY: ACT Laboratory Ltd.
PHONE: 800.980.9997
URL: www.actlab.com/gamegear

8

The joystick utilizes noisy microswitches as opposed to potentiometers. While this works wonderfully with fighting games and arcade-style shooters, games relying on analog incremental controlling, such as flight sims, suffer greatly with the PowerRamp.

But *hey*, you want the PowerRamp for busting combos, not smoking bogies—and in this case, the controller performs outstandingly. *Virtua Fighter* and *Mortal Kombat 3* feel you're back at the arcades, although the PowerRamp requires reprogramming to take advantage of special keystroke moves. The action buttons aren't spread out too widely, making hardcore ball-breaking a comfortable experience. Unfortunately, occasional flooding of the keyboard buffer results in unwanted commands continuing to spew from the PowerRamp.

With its programmable prowess, the PowerRamp spanks out intense arcade action.

PC Arcade

It may be prettier, but lack of programmability becomes the PC Arcade's Achilles Heel.

InterAct's PC Arcade stick is a solid performer that suffers some serious programming deficiencies.

A sturdy metal base and wide footprint guarantee the PC Arcade joystick a solid place on your desk. The eight ergonomically placed action buttons may be spread too far apart for smaller hands, while two minuscule buttons for toggling auto-firing sit away from bigger siblings. But, the absence of any other buttons foreshadows the PC Arcade's lack of customization.

Don't let the eight buttons fool you—InterAct's PC Arcade stick functions as a six-button arcade-styled controller. The two outer, lower buttons emulate the buttons directly above them, so don't plan on using them for any other function. Win95 drivers ship with the product, but DOS games will have to support the hardware directly in order to utilize the other four buttons. The stick, like ActLab's PowerRamp, uses microswitches instead of potentiometers, resulting in a noisy, short-throw joystick.

Mortal Kombat 3's DOS-based mayhem refuses to acknowledge the existence of extra buttons, forcing us to play the game in four-button mode. *Virtua Fighter*, even though it is a Win95-native, doesn't allow remapping the game controllers to take advantage of the extra buttons. While the response of the controller is tight and precise, programming problems keep rearing their ugly heads and spoiling the fun.

boot verdict

PRICE: $59.99
COMPANY: InterAct Multimedia Prod.
PHONE: 800.732.6866
URL: www.interact-acc.com

5

PC Arcade Pro

InterAct's other heir apparent is the PC Arcade Pro. A smaller, six-button version of the PC Arcade joystick, this beefy beast has a few more tricks up its sleeve, such as two levels of auto-firing per individual button.

The small action buttons feel a bit softer than its larger kin, while the joystick's lack of microswitches results in noise-free gameplay.

Six buttons and two levels of auto-fire cannot save the PC Arcade Pro from it's sibling's fate.

The smaller footprint should please those with limited desktop real estate, and the PC Arcade Pro performs admirably with both *Virtua Fighter* and *Mortal Kombat 3*.

But, like its big brother, that lack of programmability curses the PC Arcade Pro like a freakin' cold that just won't go away.

boot verdict

PRICE: $39.99
COMPANY: InterAct Multimedia Prod.
PHONE: 800.732.6866
URL: www.interact-acc.com

5

S/W

Superfassst

How do they do that?

Superfassst promises—you guessed it—greater speed for your hard drive (to the tune of 496 percent). This isn't greasy kid's stuff, this is superfine empirical public spin.

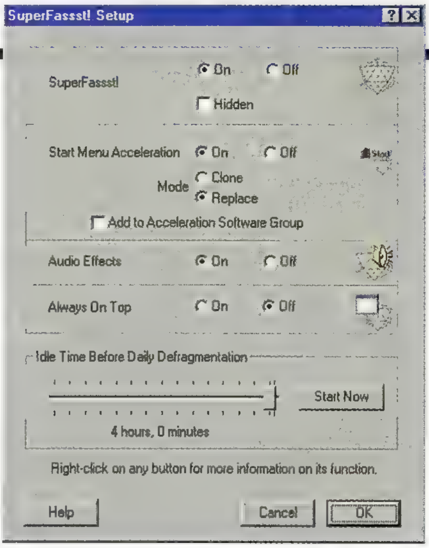
And it works. Acceleration Software International isn't forthcoming about exactly how *Superfassst* achieves its performance gains, but it does accelerate application launches, multitasking, and file system operations. However, file system acceleration only works if you're running Win95 on a high-end Pentium or a Pentium Pro.

The interesting thing about *Superfassst* is how interdependent its three acceleration techniques are. Toward the end of installation, the utility asks to defragment the host hard drive, since seeking is one of the things a hard drive is slowest at. Although the defragmentation is done via Microsoft tools, having huge tracts of related information opens the door for other mysterious enhancement techniques. Likewise, multitasking often makes use of virtual memory when a program is switched out. If disk performance is improved, multitasking performance will also be improved.

To accelerate application launches simply drag the application's icon onto *Superfassst*'s acceleration window. Interestingly enough, *Superfassst* can't accelerate all programs. It will accelerate most though, and when it does, it creates a new, slightly modified icon for the application and deposits it on the desktop. The new icon allows easy comparison of the accelerated program with the original version—the results are pretty convincing—but the new icons can also quickly clutter your workspace. (*Superfassst* Version 1.1 is now available as a web update and allows users to replace original icons with the accelerated ones, thereby avoiding this problem. Old icons are stored in a separate folder so they can be replaced in the event of an uninstall.)

Superfassst could do a better job of estimating the performance gains it's likely to deliver. If you install once, you'll get a nice, believable performance boost estimate (694 percent in one of our tests); but if you then uninstall and immediately reinstall, *Superfassst* will proclaim an even loftier boast (in the order of 852 percent). This is probably because it's making bad assumptions about the fragmentation of the drive, rather than having a quick look-see.

Superfassst may not boost your hard drive's speed to seven times its natural state, but it will certainly make it more spunky than before.



SuperFassst! Setup

SuperFassst! ● On ○ Off

☐ Hidden

Start Menu Acceleration ● On ○ Off

Mode ○ Clone ● Replace

☐ Add to Acceleration Software Group

Audio Effects ● On ○ Off

Always On Top ○ On ● Off

Idle Time Before Daily Defragmentation

4 hours, 0 minutes

Right-click on any button for more information on its function.

***Superfassst* will accelerate most—but not all—programs in order to boost the speed of your hard drive.**

Application launch times are cut to half or even one-third of their original times. Multitasking switch-ins and -outs are smoother, and disk transfer rates never suffer from a good defragmentation. Also, deinstallation is simple. You probably won't want to, but it's nice to know that it's easy to do.

— *Marisano James*

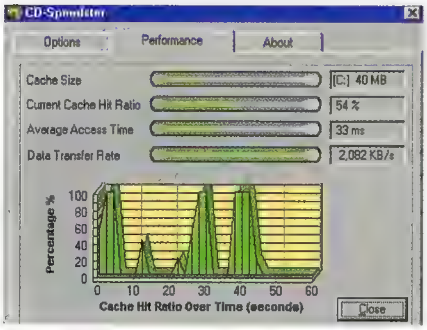
boot verdict

PRICE: $59.95
DEVELOPER: Acceleration Software International Corp.
PUBLISHER: Acceleration Software International Corp.
PHONE: 360.697.9260
URL: www.accelerationsw.com

9

CD-Speedster

The fast track



CD-Speedster

Cache Size [C:] 40 MB

Current Cache Hit Ratio 54 %

Average Access Time 33 ms

Data Transfer Rate 2,082 KB/s

It works. *CD-Speedster* will reduce your CD-ROM drive's transfer rates and effective access times.

CD-ROM drives are getting faster all the time, but faster's never fast enough. Enter *CD-Speedster*, a shiny pair of new track shoes for your CD-ROM drive. This spry utility installs in minutes and after a quick reboot you're in the running.

CD-ROM speed enhancers work by cacheing CD information on faster devices. Since hard drives are usually much faster than CD drives, putting frequently accessed information on them increases CD performance. *CD-Speedster* also includes a dynamically resizeable RAM cache. When RAM's available, the utility will use it in lieu of the hard drive cache, thereby further boosting performance.

CD-Speedster is quite effective, but just as track shoes won't do you much good before you've put them on, *CD-Speedster* won't help you the first time you use it with a CD-ROM. That's because an empty cache has nothing to offer. In fact, the first run of a new CD-ROM may be marginally slower than without the utility, because it takes a little time to put information in a more accessible medium. After lacing up though, *CD-Speedster* reduces your CD-ROM drive's transfer and effective access times considerably.

We loaded a *SkyNet* mission from a minimum install and even with a paltry 16MB of hard drive space dedicated to *CD-Speedster* (the smallest cache *CD-Speedster* allows) missions loaded from an 8x CD-ROM drive in about one-quarter of the time they took without it. Microsoft's *Encarta* was only about 66 percent faster with the utility, however, and increasing the cache to 40MB had little effect. This seems to be because *CD-Speedster* also makes effective use of a RAM cache

You may remember Syncronys from its infamous *SoftRAM95* utility, but this time around they have a true player. If you have spare hard drive space and a few CD-ROMs you use often, *CD-Speedster* will work well for you. If, on the other hand, you don't tend to frequently use the same CDs, you may find yourself running in circles.

— *Marisano James*

boot verdict

PRICE: $24.95
DEVELOPER: Syncronys Softcorp
PUBLISHER: Syncronys Softcorp
PHONE: 888.777.5600
URL: www.syncronys.com

8

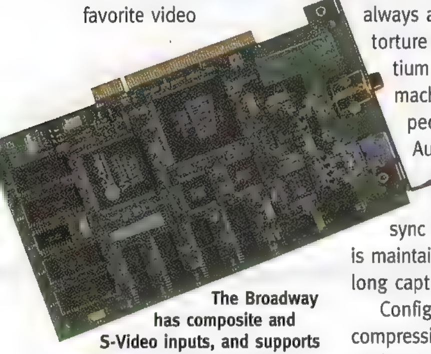
H/W

Broadway 2.0 MPEG Video Capture

Give my regards...

boot KICK ASS! PRODUCT

If you're serious about video and think you have what it takes to make the first great FMV game, the Broadway card is the right tool for you. It captures full-quality video at 30fps compressing it in real time into an editable MPEG format. You can then use your favorite video editing software or the bundled Ulead *MediaStudio VE 2.5* to create your masterpiece; then fire up the Broadway hardware again to compress the video and audio to fully compressed MPEG-1 at 3x real time—as opposed to the 30x to 60x speed of software-only MPEG compression. And now with the new version 2.0 hardware, Broadway can fully compress to MPEG-1 in real time while recording—something previously only possible with hardware costing thousands of dollars.

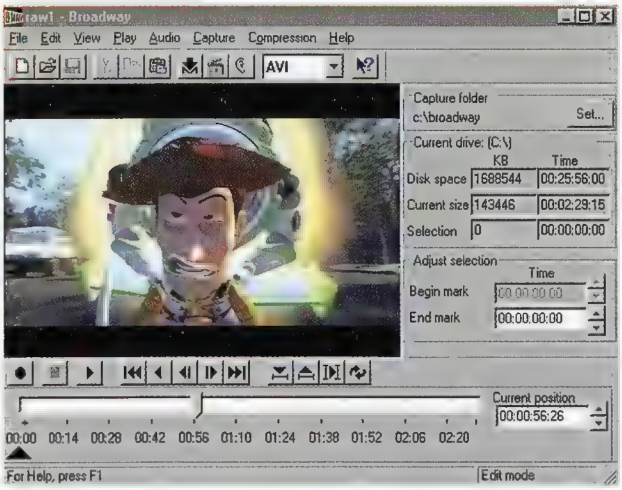


The Broadway has composite and S-Video inputs, and supports PAL and NTSC format video.

Broadway captures at the MPEG-1 standard SIF (352x240) resolution, and always at 30fps. In our torture tests on a Pentium Pro 180MHz machine it never dropped a single frame. Audio is captured via your sound card, and perfect sync with the video is maintained, even on long captures.

Configure Broadway's compression based upon the MB/minute desired, or just select your eventual playback device and go with the defaults (hard drive, Video-CD, 1x CD-ROM, 4x CD-ROM, Internet DL, etc.). To test the compression, we recorded a 2.5 minute action-filled clip from *Toy Story*. Using the default quality setting, the raw AVI was 143MB, and it took Broadway only 4 minutes and 40 seconds to compress it into a very high-quality 22MB MPEG file.

Artifacts were still noticeable during fast motion, but by cranking up to 17MB/min they were almost entirely eliminated. The maximum compression settings achieved a 2.7MB quarter-screen file that turned into pixelated mush during fast motion, but it always seemed as if Broadway was delivering the best output possible with the given constraints.



Capture folder: c:\broadway

Current drive: (C:\)

	KB	Time
Disk space	1688544	00:25:56:00
Current size	143446	00:02:29:15
Selection	0	00:00:00:00

Adjust selection

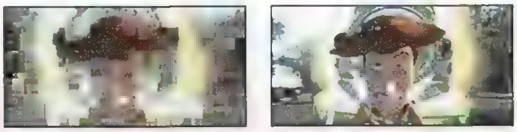
	Time
Begin mark	00:00:00:00
End mark	00:00:00:00

Current position: 00:00:56:26

For Help, press F1

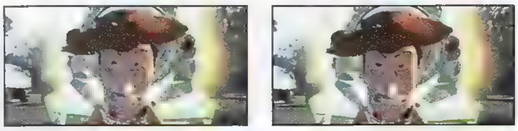
Edit mode

The Broadway user interface is simple and easy to use. You can capture either to an editable AVI format for compressing later or directly into a non-editable, highly compressed MPEG format—in real time!



These frames were compressed at quarter-screen res (176x120); left frame at minimum 1.2MB/min data rate; right frame at 3.2MB/min.

The quality of the real time direct to MPEG encoding was always identical to that achieved by compressing the AVIs, and resulted in near-identical file sizes when given the same compression settings. The only problem encountered when using Broadway was a hardware FIFO overflow error when trying to compress to the maximal output rate of 23.3MB/min. Throttling back a bit cleared that up, but it was still puzzling.



The image on the left shows 5MB/min at full MPEG-1 res. Using the default rate (8.6MB/min) results in a slightly cleaner picture.

The Broadway's manual is excellent, almost a textbook for digital video production. The Broadway 2.0 board itself is a marvel of technology, bringing the price of doing professional quality MPEG work into the realm of mere mortals. If you are serious about MPEG, there is no better (affordable) tool for the job.

— *Chris Dunphy*

MPEG Decoder

Raw NTSC video contains 28MB of data per second. Think how fast that would fill a hard drive! An international standards body known as the Moving Pictures Expert Group has defined two compression standards for squeezing video down to a manageable size, and they're working on a third.

MPEG-1: was defined to facilitate streaming VHS-quality video and CD-quality audio off a 1X (150K/sec) speed CD-ROM. The resolution is 352x240 at 30fps, and most Pentium class computers can decode MPEG-1 streams in real time with software. An MPEG-1 decoder is included with Microsoft's ActiveMovie.

MPEG-2: is intended for high-bandwidth data streams and it's the technology behind DSS satellites and DVD video discs. Resolution is variable, but is generally 720x480, and the data rate ranges from 500K/sec to more than 2MB/sec. To decode MPEG-2 streams in software generally requires an MMX class machine.

MPEG-4: is a standard still in the works that will define compression for ultra-low bandwidth video applications such as video conferencing over phone lines or the Internet.

boot verdict

PRICE: $995
COMPANY: Date Translation
PHONE: 800.249.1000
URL: www.b-way.com

9

H/W

Bigpicture Video Kit

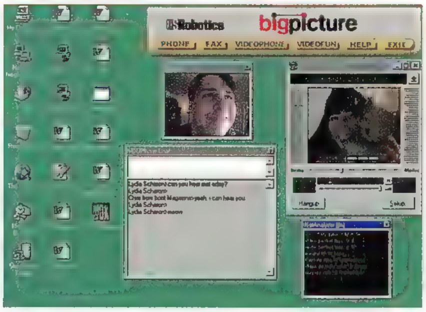
Too many kooks spoil the stew

Sometimes if you take a lot of ingredients and throw them in a pot, you get a delicious stew. Usually, though, you get gruel. The Bigpicture Video Kit delivers the promised high-quality camera, video capture and editing software, plus a videophone-capable 33.6 modem—but the recipe is long and arduous, and the end result just doesn't taste right.

Installing and configuring the two-card Bigpicture Kit is hellish, giving a new meaning to the term plug-and-pray. We tried installing it in three different systems, and all of them were multi-hour ordeals. First, the driver info files on the CD-ROM seem to be incompatible with the new device installation wizard found in Win95 OSR2. OSR1 driver installation was painless. But then the IRQ conflicts began... on every system. The VideoModem was the culprit here, and only much tweaking of the device manager enabled us to get it to boot without a warning. Amazingly, even after all the conflicts were resolved, installing *Microsoft Front Page* on one of the machines triggered a relapse.

Another pain is that you must crawl behind your PC and move the camera's microphone line from your sound card to the modem whenever you want to use the videophone mode.

In use, some components excel while others are only tolerable. The tiny ball camera is exceptional, producing one of the best pictures we've seen from a desktop camera. The video capture card and bundled Asymetrix *Digital Video Producer* software do a fair job of grabbing moving images at 320x240 resolution at 15fps, but choke on more demanding captures. The 33.6 modem works as expected once the IRQ conflicts are resolved, and the bundled software lets you move data and also use the modem as an H.324 videophone, full-duplex speakerphone, voice-mail system, and fax. The modem's second onboard DSP aids in voice compression for conferencing, and will eventually be upgradeable to 56Kbps and DSVD. Completing the software bundle is *Kai's PowerGoo*, and the equally cool *VDOPhone* Internet videoconferencing package.



Frame rate must be measured in seconds per frame rather than frames per second, but Bigpicture videoconferencing for free is a fun trick that leaves phone companies steamed.

If you have your own NTSC camera, you can get the kit minus the nifty ball camera for $249. And if you're willing to skip the video modem frustration and don't plan on doing dial-up videoconferencing, you can get just the camera and capture card for $249. Frustratingly, this final package doesn't include the *VDOPhone* software, otherwise it would be perfect for those interested in video over the net.

— *Chris Dunphy*

boot verdict

PRICE: $399
COMPANY: U.S. Robotics
PHONE: 800.342.5877
URL: www.usr.com

4

S/W

Video Express Mail

Dead on delivery

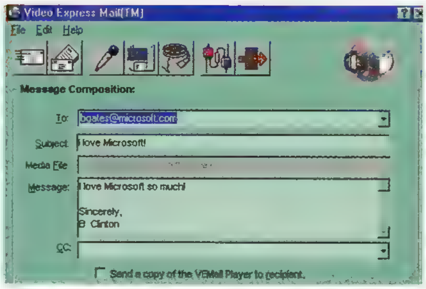
Is this a joke? If so, *Video Express Mail* is a very *im*practical joke, bordering on cruel, and definitely insulting.

Labeling itself as "a futuristic e-mailing system," *Video Express Mail* claims to send streamed multimedia messages as e-mail attachments, although after two hours of frustrating attempts we were still unable to verify this claim.

If this is the future, count me out.

There isn't nearly enough space here to describe all the ways in which this product fails, but for loyal *boot* readers, we'll try to identify a few.

The installer is clumsy and puts invalid shortcuts in the Start menu, apparently because we chose a non-default location for installation. The bare-bones e-mail client constantly presents confusing dialogs (e.g., Send Message leads to a choice of "transport protocols," both of which have unintelligible, vague, and very similar descriptions) and the client is easier to crash than a steel wheeled skateboard. The lack of attention to detail even crops up in the bevy of misspelled menu items.



To: bgates@microsoft.com
Subject: I love Microsoft!
Message: I love Microsoft so much!

Sincerely,
B Clinton

CC:

☐ Send a copy of the VEMail Player to recipient.

Beware: *Video Express Mail* is very volatile.

When exiting or creating a new message, there's no warning that the action will delete your current message. The sample audio files don't work over standard 28.8 connections and despite being touted as great for intranets, the product's streaming doesn't work through firewalls, and guess what? Practically every corporate network has firewalls.

Perhaps most importantly, it's questionable whether streamed multimedia attachments are even *worth* $79.95. Perhaps if the publisher paid users $79.95 to try and make a go of this shambles... Nah, still doubtful.

— *Neil Redding*

boot verdict

PRICE: $79.95
DEVELOPER: ImageMind Software
PUBLISHER: ImageMind Software
PHONE: 800.321.5933
URL: www.imagemind.com

2

S/W

Scourge of Armagon and The Dissolution of Eternity

You always frag the ones you love

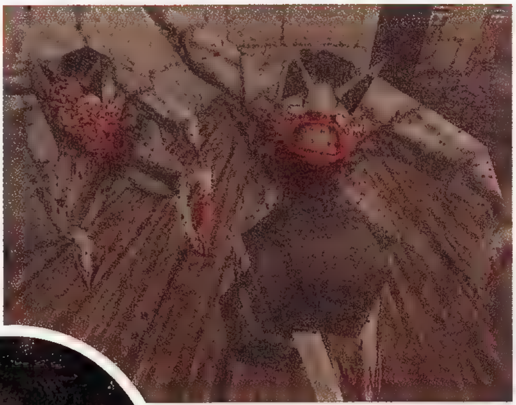
The minions of Shub-Niggurath never rest. Two officially blessed-by-id *Quake* add-on packs have arrived chock full of intricate levels stocked with slavering monstrosities. Hipnotic Interactive's *Scourge of Armagon* and Rogue Entertainment's *The Dissolution of Eternity* bring new check-your-underwear intensity.

Going beyond most hacks or patches—which change texture maps on existing monsters—each developer came up with new beasties, as well as new methods to shred your flesh. And both packs place greater emphasis on traps.

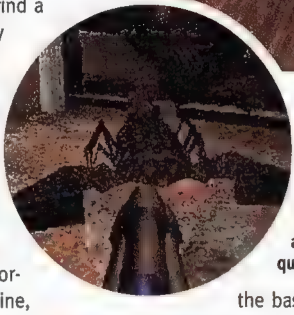
Sure, *Quake* had its share of disappearing floors and teleporting monsters, but the new swinging pendulums, rotary saws, and a host of other traps will turn you into gibbed chunks.

Our favorite new *Scourge* baddies are the Gremlins. These nasty, blood-drenched imps steal your weapons and use them against you. Worse, if they find a dead body they proceed to feast upon the corpse and spawn!

Another *Scourge* monstrosity is the Centroid, a synthesis of scorpion and machine, armed with dual nail guns. The *Dissolution* compendium is filled with Wraiths (floating specters that explode when killed), Phantom Swords, and Electric Eels among the mix.



Even Thor would be proud if he saw you wielding the mighty Mjolnir against *Scourge*'s Gremlin hordes.



There's nothing like staring down a Centroid's quad barrels.

Scared to bring the noise? New firearms kick the bass to dispatch these hoary hordes.

Scourge of Armagon has you gunning down the heathens with a triple-barreled laser cannon (whose shots ricochet around corners), a grenade launcher firing proximity mines that stick to surfaces, and finally, the much-promised lightning hammer, Mjolnir.

The Dissolution of Eternity has spread grenade launchers and a salvo rocket launcher, a plasma gun (which hurls a ball of electricity spitting out fingers of lightning), and the lava nails upgrade gives red-hot projectile spewing capacities to both nail guns.

On top of all your favorite pentagrams and quad damage, *Scourge*'s medieval-flava power-ups include the Horn of Conjuring (to mesmerize monsters into allies) and the Empathy Shield. The Horn is particularly boss. Simply enchant a Shambler and send your shuffling new pet to dispatch those pesky Vores.

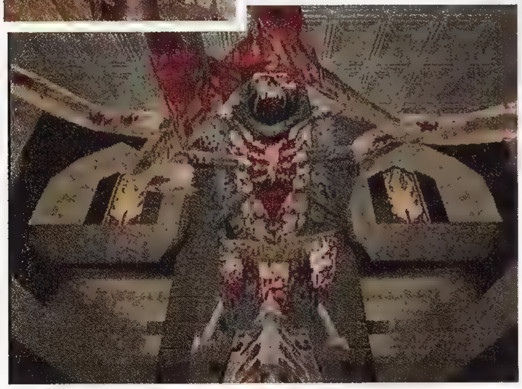
Dissolution takes a more technological edge, with personal energy shield, anti-gravity boots, and the Vengeance Sphere (a hovering plasma ball that detonates when its user is killed).

Hipnotic's open canyon levels show that the *Quake* engine can do effective exterior terrain and Rogue's spires, castles, and sarcophaguses exude the dark, Gothic overtones that id started. The new levels are vast—we found it too easy to get lost during deathmatches. But, in true *Quake* style, there are ample ambush points.

Both utilize a new *Quake* executable (v. 1.07), but still need registered *Quake* to run. If you're knee-deep into accelerated *Quake* (Vérité or OpenGL) you'll have to wait for patches from id to enjoy bilinear filtering and 3D acceleration with these new fragfests.

— *Andrew Sanchez*

Enthralling level designs highlight these mission packs.



***Dissolution*'s Wraiths are eager to embrace you. Charge your plasma gun and show them that love hurts.**

checklist

Multiplayer
LAN ☑
Modem ☑
Direct/Serial ☑
Internet ☑

boot verdict

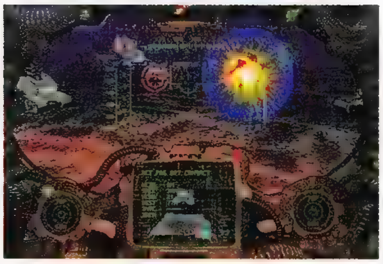
PRICE: $29.95 each
DEVELOPER: Scourge of Armagon—Hipnotic Interactive; The Dissolution of Eternity—Rogue Entertainment
PUBLISHER: Activision
PHONE: 310.473.9200
URL: www.activision.com

9

S/W

Archimedean Dynasty

Taking on water and sinking fast



TRY IT ON THE DISC

The future holds no fish... only war. *Archimedean Dynasty* takes 83 pages to describe why you find yourself in an intense futuristic firefight at the bottom of the ocean, but think of underwater *Wing Commander* and you're not far off.

If the color palette was darkened and the air bubbles taken away you'd find yourself in outer space, fighting spaceships instead of submarines. This doesn't say much for the game's realistic take on undersea combat.

The graphics engine is in dire need of 3D acceleration. On a P200 MMX machine at 640x480 64k colored full-screen mode with all the visual options such as perspective correction and Gouraud shading engaged, the game runs at a barely adequate 15fps. Even with the tasty visual options, the textures—which look fine far away—degenerate into a pixelated mosaic up close. Bilinear filtering with a 3Dfx or Rendition would have helped immensely.

The fact that your enemies and underwater terrain exist as polygon objects only exacerbates this problem, and the low frame counts in the explosions make it downright laughable.

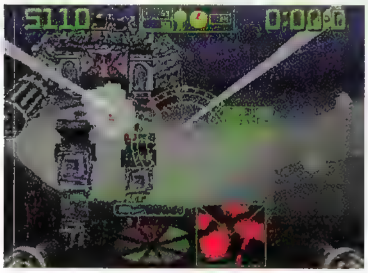
Throw in an unrealistic underwater flight model, crazy background techno music, and some badly written cut scenes, and not even the "intense" text-based linear dialogue can save *Archimedean Dynasty* from a watery grave.

— *Alan Smithee*

boot verdict

PRICE: $29.99
DEVELOPER: Blue Byte
PUBLISHER: Blue Byte
PHONE: 847.995.9987
URL: www.bluebyte.com

5



Krazy Ivan

Nutty Russians and big pixels

TRY IT ON THE DISC

It's a good thing for games such as *Krazy Ivan* that bargain bins exist, because that's where this first-person 3D shooter will end up.

The game casts you in the role of mentally unstable Ivan Popovich, an early 21st century mech jockey working for the Russian military. Your sole purpose is to wipe out five expanding energy fields located in various parts of the globe. Trying to stop you are other mechs who, oddly enough, carry prisoners within their bowels which you must rescue. Ported from the early '96 PlayStation game, this version could have made an impact on the PC had it been released at the same time.

Krazy Ivan is a Win95 DirectX game that runs at either 320x240 or 640x480. Even though the 3D engine pumps out around 2,000 polygons per second this still doesn't make the game pretty. At high resolutions the game has a VGA appearance, and the complete lack of antialiasing results in pixelation hell. On a bright note, the AI forces different tactics for each enemy. Add network support for two players over TCP/IP and IPX connections and you have a cheap way to test DirectPlay.

Krazy Ivan is an uneventful, run-around, shoot 'em-up of the most typical kind. Look for it soon at your local clearance table.

— *Bart Lane*

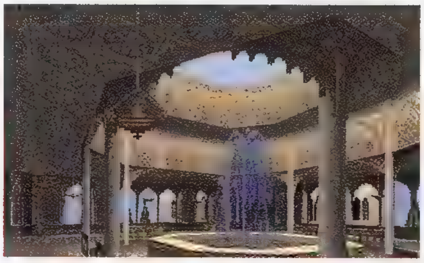
boot verdict

PRICE: $29.99
DEVELOPER: Psygnosis
PUBLISHER: Psygnosis
PHONE: 415.655.8000
URL: www.psygnosis.com

4

Realms of the Haunting

Live the nightmare



TRY IT ON THE DISC

Horror fans, rejoice! Your favorite genre is alive and rotting in *Realms of the Haunting*, a spine-tingling fantasy adventure oozing with atmosphere. You assume the role of Adam Randall, drawn by vivid dreams to investigate the death of your father and the mysterious estate of a powerful sorcerer.

Gameplay combines first-person exploration, *Duke Nukem*-style combat, and puzzle solving with over 90 minutes of cinematic cut scenes. Far from superfluous, the FMV's an integral part of the game, setting an ominous mood while advancing the story and providing clues.

Realms is a massive game, utilizing four CD-ROMs, although much of the fourth disc contains an elaborate behind-the-scenes video documentary detailing the product's creation.

The frame rate runs like a champ on any Pentium. Six video resolutions are supported, from chunky 320x200 VGA to crisp 640x480 VESA. The game isn't 3D accelerated, but Gremlin's proprietary 2 1/2D ray-cast sector-based *True 3D* engine keeps the animation fluid, although sprites become pixelated when viewed up close, no matter what the resolution.

Realms of the Haunting encompasses a diverse series of locations, intelligent puzzles, and a wide array of motion-captured beasties. Unlike other portentous flights of fantasy, much of this game's horrific urgency derives from real-world prophecies. The truth is in there somewhere.

— *Scott May*

boot verdict

PRICE: $49
DEVELOPER: Gremlin
PUBLISHER: Interplay
PHONE: 714.553.6655
URL: www.interplay.com

7

boot radar

PRODUCT ANNOUNCEMENTS: THEY **TELL** US, WE **PASS** IT ALONG

Whispering Sweet Nothings In Your Ear

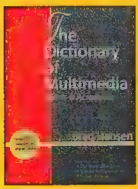
Creative Labs is shipping a new line of multimedia kits. The **Discovery AWE64 kit** retails for $299 and includes an AWE64 sound card, (capable of simultaneous 32-note hardware and software polyphony), 10-watt stereo speakers, a wireless, infrared, remote controlled 12X CD-ROM drive, and a selection of software titles including Origin's Crusader: No Regret, Activision's Time Commando, and Electronic Arts' Magic Carpet 2.

The iNFRA 12X CD-ROM drive and remote utilize a wireless IR technology that lets you control CD playback, surf the web, adjust PC audio volume, launch applications, and emulate mouse and keyboard controls. The drive has an access time of 150ms, and a constant transfer rate of 1800K/sec.

As a bonus, the drive also features Intelligent Voice technology that will use an actual voice to tell you what operation the drive or remote control is performing at any time. And, if you're not happy with the default voice commands, you can replace them with ones you've recorded yourself.
Creative Labs: 800.998.1000; www.creativelabs.com

The ABCs of DMAs

Can't remember what an FCS or an FDDI is? **The Dictionary of Multimedia**, containing definitions of words related to digital multimedia production and computer technologies, can help.



The Dictionary retails for $26.95 and covers A:B:C notation to z-sorting, includes definitions of puzzling industry acronyms such as VLSI and IBM, graphic illustrations, and extended definitions of concepts such as MIDI, FireWire, and MPEG. Also included are: an explanation of CGI conventions, WWW copyright issues, and a compilation of standards organizations and DOS commands.
Franklin, Beedle & Associates: 800.888.4741; www.fbeedle.com

Don't Leave Home Without It

The **MP8630 Integrated Projector** is a high-performance presentation system delivering 500 ANSI lumens, richly saturated colors, and SVGA resolution up to 800x600. Weighing 18 pounds, the $9,925 MP8630 is designed for portability and includes a unique carrying case, integrated handle, and a recessed, shuttered lens that can be closed for protection during travel. The MP8630 is also equipped with remote mouse control, and features full video and audio capabilities, and inputs for RGB, composite, and S-Video. The MP8630 also offers video compatibility in NTSC, PAL, SECAM, and S-VHS; and includes multi-voltage power options for overseas travelers.

3M Visual Systems Division: 800.364.3577; www.3m.com

On the Outside Looking In

U.S. Terrain Series, a new CD-ROM featuring the complete USGS series of both 1:24,000 and 1:100,000 topographic maps for various U.S. regions, is now available.

Each CD-ROM contains a complete series of maps totaling more than 200 for each geographic location. Maps are geo-referenced and markers can be entered in latitude and longitude that can be read directly from a global positioning network unit. You can also calculate distances and area size, or search a database containing town and community names, and natural or man-made features.

Maps for Connecticut, Massachusetts, New Hampshire, and Vermont are available now for $99 each, Maine, with four CD-ROMs, retails for $199. Rhode Island, California, Wisconsin, and maps for the rest of the United States will be released later this year.
Earthvisions: 800.627.7236; www.earthvisions.com

3D as Easy as 1-2-3

You can now produce an unlimited number of photorealistic 3D textures using **Texture Creator**, a new software program useful for developers and designers of web sites, presentations, games, and digital graphics.

Texture Creator retails for $129 and lets you easily render any texture to disc at any size and resolution. As the image size increases, so does the detail level.

Texture Creator recreates textures using Procedural Rendering, allowing you the freedom to design and edit at any time. Natural textures, including woods, clouds, stones, and ripples, are included, and you can create unique images and effects by mixing these with man-made patterns, such as logos, checkers, and dotted lines.

Texture Creator

Texture Creator provides great control of color and design, and gives a dimension of freedom and creativity unavailable with scanned textures. Files can be saved in many formats, including JPGs and GIFs.
Three D Graphics: 800.913.0008; www.threedgraphics.com

Prints in an Hour, or They're Free!

If you're pining about the disappearance of your local FotoMat or are looking for a cool way to transfer those files from your digital camera, take a look at Fuji Films' **Frontier Digital Lab System**, a revolutionary "hybrid" minilab that employs a new technology combining the best of silver halide technologies with new digital functions.

The Frontier Digital Lab System includes the digital SP-1000 scanner and image processor, and an LP-1000P Printer and Paper processor. Together, this compact unit creates prints on high-quality Fujicolor paper from negative 135 formats, Advanced Photo System files, film scanners, and digital cameras.

The system, which will be available later this summer, can process approximately 1,000 prints per hour. Although firm pricing isn't yet available, expect the Frontier Digital Lab System to cost between $100,000 and $200,000.
Fujifilm: 800.378.3854; www.fujifilm.com

Sweet 16

If that 8x or 12x CD-ROM drive just isn't cutting it, then spin up the **ADVCDE16E**, a new 16x CD-ROM drive. This half-height external CD-ROM drive supports all popular CD-ROM formats.

According to MicroNet Technology, the ADVCDE16E provides a high-speed access time of 150ms and a sustained data transfer rate up to 2.4MB/sec. You'll also need a SCSI host adapter, such as MicroNet's ADVPCK SCSI controller card. The ADVCDE16E is available now for $275. The ADVPCK SCSI adapter is priced at $99.

MicroNet Technology Inc.: 714.453.6100; www.micronet.com

Circuit City

If building a PC from scratch suits your fancy, check out **The Encyclopedia of Electronic Circuits** CD-ROM, a comprehensive collection of more than 1,000 circuit designs from such industry leaders as Motorola, Texas Instruments, and National Semiconductor.

The CD-ROM is priced at $99 and contains 142 searchable circuit categories including audio circuits, display circuits, radio circuits, and power supplies. Locate a topic to see a text description of the circuit along with a full circuit diagram, which can be viewed using the built-in schematic viewer. Many schematics include mechanical details of parts, IC packages, and waveform diagrams.

Although free demo software is included on the CD-ROM, you can also call a toll-free number for access to four locked CAD products including SuperCAD (a full-featured schematic editor), SuperSIM (a digital simulator), SuperSPICE (an analog simulator), and SuperPCB (printed circuitboard creator).
McGraw Hill; 800.722.4726; www.books.mcgraw-hill.com

OS/2 Users... Try This at Home

Trials of Battle, a fast-paced, first-person action game designed exclusively for OS/2, takes you to a distant world to compete in combat vehicles equipped with armor, weapons, sensors, and other abilities. Decimate your opponents in order to win money, gain points, and move up in rank.

Trials of Battle retails for $45 and features an aggressive computer AI and sophisticated computer-controlled players. Up to 12 players can be in the arena simultaneously or join a game already in progress. LAN, direct modem, and Internet play are supported.

Trials of Battle also features adjustable graphics settings, which allow users with high-end machines to play in realistic, texture-mapped environments. To play, you'll need OS/2 Warp 3.0 or later. A Win95 version is planned for later this year.

TRIALS OF BATTLE

Stardock: 800.672.2338; www.stardock.com

Video To Go

Have you ever videophoned home to mom while on the road with your notebook? Now you can, and it's not AT&T making it possible.

Sigma Designs has unveiled a low-cost, low-power color digital camera and PCMCIA-based capture chip that'll quickly turn any zoomed video port equipped notebook into a roving video communications machine. The capture chip and camera are currently available to OEMs for less than $150, but retail products making use of this technology should be available in three or four months for about $300.

Sigma Designs: 510.770.2601; www.sigmadesigns.com

To have your products listed in Radar, send product information to: radar@bootnet.com

boot labs Review Policies

__boot__ isn't like any other computer magazine, and neither is our product __evaluation__ process. We don't test equipment in the cold, sterile environment of a warehouse-sized lab, and we don't write our reviews based on the __test scores__ that lab-coat-wearing technicians scribble on clipboards.

Our review __scores__ are based on a combination of objective __benchmark__ testing, real-world performance, and our __subjective__ evaluation of features, performance, and the many less tangible __characteristics__ that go into a product. All of our evaluations are based on __hands-on__ use of the product.

boot KICK ASS! PRODUCT

Only the **best** earn enough respect to be worthy of our **editors'** **choice** award.

1 2 3 4 5 6 7 8 9
BOOT RATING
5
WINDOWS GRAPHICS
5
DESCENT II
5
QUAKE
boot-o-meter
5
PREMIERE TRANSITION
5
PHOTOSHOP FILTER
5
LIGHTWAVE 3D RENDER

The boot-o-meter explained

For our tests, we use Ziff-Davis' WinBench 96 suite of benchmarks to measure CD-ROM and hard-disk drive performance (kilobytes per second), as well as graphics speed under Windows (millions of pixels per second).

All systems are tested at 1024x768 resolution with 16-bit color depth. All notebooks are tested at 800x600 resolution with 16-bit color depth (they're also tested at higher resolutions, if higher resolutions are supported).

We judge DOS video performance by measuring the number of frames per second that a system is capable of pumping out while playing games such as *Descent II* (at 640x400 resolution) and *Quake* (at 640x480 resolution on desktop systems; 320x480 res on notebooks).

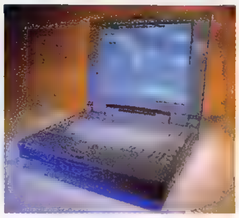
In our real-world tests, we measure how long it takes a system to perform specific tasks: rendering a video transition in Adobe's *Premiere*, applying a Gaussian-blur in *Photoshop*, and rendering a wireframe scene in NewTek's *LightWave 3D*.

The performance is gauged on a scale of 1 to 9 in each of these areas; we then average the scores, and arrive at an overall performance rating. The details of each test (specific frame counts and such) are always available on the *bootNet* Web site at **www.bootnet.com**.

Our performance scales are based on systems that we consider to be among the best in their class, and we change those reference standards every six months. If the system reviewed equals or exceeds the performance of the reference platform (a score of five or better), the boot-o-meter dial is green; if it scores a four, the dial is yellow; and if it scores a three or less, the dial is red.

Our Reference Desktop PC

***Gateway's P5-166XL** is our reference desktop computer because it's a workhorse, delivering solid benchmark scores all around. Systems shipped since the P5-166XL—especially 200MHz Pentium systems—should at least match its performance.*



Our Reference Notebook PC

*We selected **Fujitsu's Monte Carlo** as our reference notebook because of its excellent benchmark scores. The Monte Carlo's use of more expensive VRAM, instead of the slower DRAM, resulted in exceptional graphics performance.*

8

The bootVerdict

The fastest computer in the world is useless if it's poorly designed. That's why we evaluate a host of subjective criteria in addition to rigid benchmarks. We look at a machine's overall design, its ergonomics, expandability, ruggedness, and advanced features.

We also carefully consider a manufacturer's component choices, including the quality of the sound card, speakers, modem, keyboard, and mouse. We count expansion slots and drive bays. We take off the case and put it back on. We plug in drives and cards to judge how easy—or difficult—it is to expand the machine. These might seem like minor considerations, but they have an enormous impact on the level of satisfaction a new computer delivers. Our final rating is an amalgamation of the objective benchmark ratings and these subjective judgements.

DOUBLE TAKES
GIVE A SECOND EDITOR'S HANDS-ON OPINION OF THE SYSTEM BEING REVIEWED.

SEPARATED AT LAUNCH?

Flamboyant French Fry **Jean-Louis Gassée**

Reheated Big Mac **Steve Jobs**

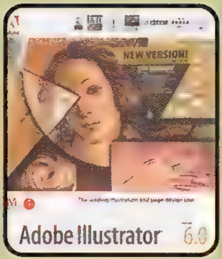
MMX
intel inside
pentium

Graphically superior **MMX**

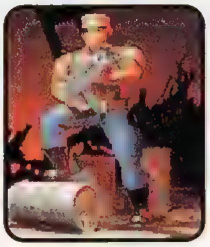
Supremely slippery **Castrol GTX**

The Most Powerful Design Tool For Print & Internet Graphics
FREEHAND 7

Technically deft Macromedia **Freehand**


NEW VERSION!
Adobe Illustrator 6.0

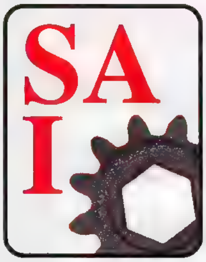
Deftly technical Adobe **Illustrator**



Fun shoot 'em-up ***Duke Nukem 3D***

Done Shot 'em ***The Deer Hunter***

Last-chance career starter **Control Data Institute**



First-rate gear charter **Sequoia Automotive Institute**

Surprisingly effective IBM **TrackPoints**

Increasingly obsolete **pencil erasers**

The way bold **28.8Kbps**

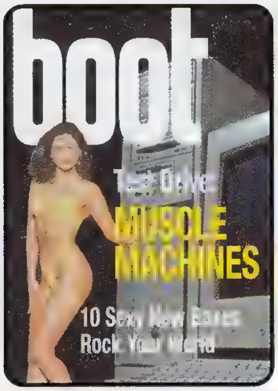
The same old **33.6Kbps**

Who'd-have-thought-it **WebTV**

No-one-bought-it **CDi**

Forward-thinking operating system **CP/M**

Reverse-engineered rip-off **MS-DOS**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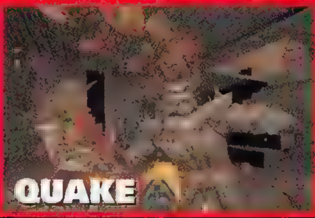
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every game
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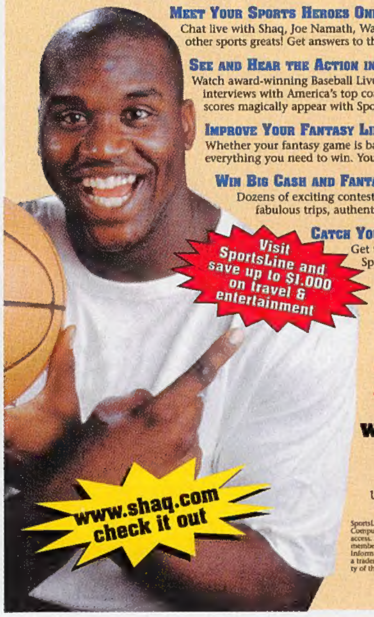
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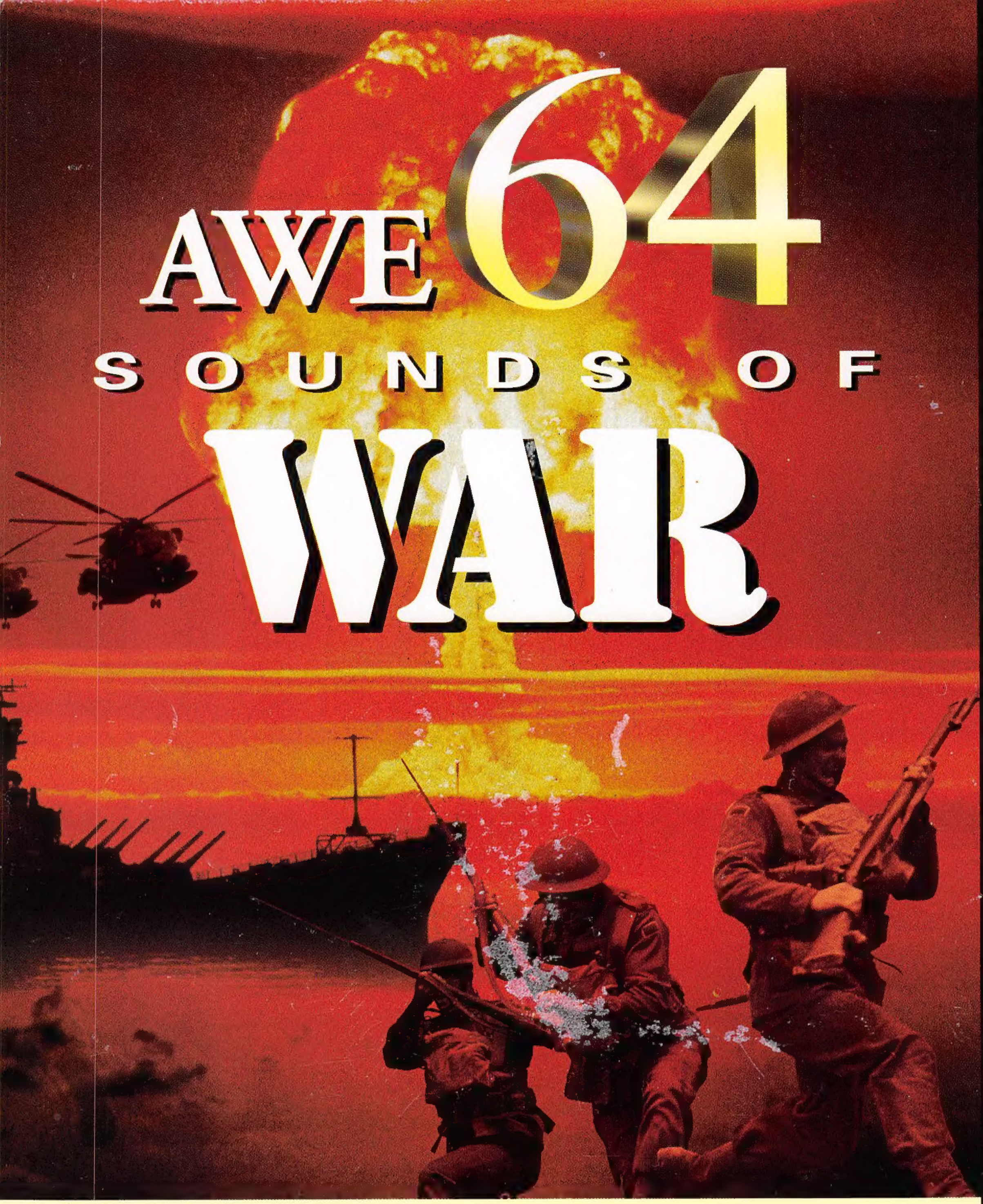

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8. Random Gunfire.
9. "Private Curtis Jones, 51st Airborne"
10. Anti-Tank Guns.
11. The Clink Of An Aluminum Mess Kit.
12. Dangling Dog Tags.
13. Ricocheting Bullets.
14. Sigh Of Relief.
15. A Harmonica Playing Yankee Doodle.
16. Give peace a chance.
17. Flight of the Valkyrie.
18. Shovels Diggin Trenches.
19. Prayer.
20. Dirty Jokes.
21. "Sniffle."
22. Nervous Laughter.
23. Letters From Children.
24. Bombs bursting in air.
25. Battle Plans.
26. "Over The Top, Boys!"
27. The Battle Hymn Of The Republic.
28. Bullets Whizzing Past Your Helmet.
29. Random Snipers.
30. Surface To Air Missiles.
31. Anti-Aircraft Fire.
32. The Doors Playing "The End."
33. The Whistle Of Tracers
34. "Medic! Medic!"
35. The Star Spangled Banner.
36. The Thunder Of An Air Strike.
37. "Hit The Dirt."
38. A Rain Of Debris Landing All Around You.
39. Taps.
40. "Uurrrrpp!"
41. Low Flying Sidewinders.
42. Strafing From The Air.
43. Ak-47 Assault Rifles.
44. Standard Issue M-16's.
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48. Rain.
49. Howitzers.
50. The Cheer Of Victory.
51. Quiet.
52. The Low Rumble Of Bombs In The Distance.
53. The Squawk Of A Radio Call For Help.
54. Com chatter.
55. "Surrender Now!"
56. Troops Marching.
57. Jungle Animals.
58. "The Biscuits In The Army, They Say Are Mighty Fine."
59. The Angry Croak Of Your Commander.
60. A Tropical Storm.
61. A Blazing Oil Well Fire.
62. Unrolling Adhesive Bandages.
63. "Ugh!"
64. "I Wanna Go Home."

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